A MULTIMODAL APPROACH TO THE ASSESSMENT AND TREATMENT OF CHILDREN WITH WITH LEARNING DIFFICULTIES.

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DEGREE OF Ph.D.

JANUARY 1987.

DEDICATION.

I dedicate this work to three marvellous children:

EMMA, JENNIFER, & NEIL.

ACKNOWLEDGEMENTS.

The following individuals gave freely and openly of their time and energies throughout the duration of the research project reported in this thesis, a contribution I gratefully acknowledge.

Mr. R.Thompson, Kilmarnock Child Guidance Centre.
Mr. L. Nicholl, Ayr Child Guidance Centre.
Ms. A. Cuthill, Irvine Child Guidance Centre.
Ms.J.McPherson, Irvine Child Guidance Centre.
Mr. R. Rutherford, Paisley Child Guidance Centre.
Mr. H.Cummings, Paisley Child Guidance Centre.
Mr.A. Haughey, Govan Child Guidance Centre.
Mrs. C. Vassie, Kirkintilloch Child Guidance Centre.
Ms. R. Wheeler, Drumchapel Child Guidance Centre.
Mrs. M. Marshall, Ayr Child Guidance Centre.
Mr.W. Gilmour, Formerly, Silverwood Primary School, Kilmarnock.
Mrs.G. Holmes, Darvel Primary School.
Mr. H. Jones, Jordanhill College Of Education.
Mrs. M. Browning, H.M.I., Formerly, Jordanhill College Of Education.
Dr. H. Turnbull, Craigie College Of Education.
Mrs. G. Kamming, Marnock School, Kilmarnock.

It is also important to express a debt of gratitude to the schools, and above all, the teachers, who gave so freely of their time and went out of their way to be helpful and cooperative at all stages in the project. Additionally, the children and their parents involved at all stages of this work deserve my deepest thanks and respects.

The debt of gratitude I owe to my supervisor - Dr.Ian Wallace, Departent of Psychology, University of Glasgow - is immense. His encouragement and constructive criticisms provided the framework without which I would have gone wildly astray. I must pay particular thanks to him for the manner in which his committment and computing skills extricated me from a very deep hole I had strayed into at one point.

Finally, sincere love and thanks to my wife Mary, without whose patience and understanding I could never have completed this work.

CONTENTS.

SUMMARY.

A MULTIMODAL APPROACH TO ASSESSMENT AND INTERVENTION WITH CHILDREN WITH LEARNING DIFFICULTIES - A SUMMARY.

The object of the research reported in this thesis was to evaluate the potential effectiveness of applying a Multimodal approach - as described by Lazarus (1976, 1981) - to trying to help children with learning difficulties referred through schools to a Child Guidance Service. It was the intention, as far as possible, to work within the normal constraints imposed on the system within which the Educational Psychologist has to work.

The research adopted a methodology based on the Decision Theoretic Model described by Edwards, Guttentag and Snapper (1975). This entailed the prior setting of objectives against which the strategies under consideration were evaluated. The Multimodal strategy was evaluated against two existing strategies which were in current use within Child Guidance Services. One of the strategies was tightly controlled and structured, whereas the other was more open to flexibility and adaptations. The evaluation was carried out in two phases: an Assessment phase and an Intervention phase.

In the Assessment phase, information was gathered on children involved in all three of the strategies, which was used to assess their suitability for receiving specialist support. This information was evaluated by 'third party' expert judges against the specific assessment objectives which had previously been set. Using the Decision Theoretic Methodology

the Utility, or perceived usefulness, of each assessment was derived. This was then compared with subjective opinions which had been developed previously based on descriptions of the three strategies. The results demonstrated that both in terms of the prior subjective opinions, and also on the basis of the actual assessments made, the Multimodal Approach was the most useful in terms of meeting the given objectives.

Subsequent progress of children going through each of the three strategies was monitored. In addition to starting data, further data was gathered on two subsequent occasions: on average nine months in each case. On the basis of the data gathered independent 'expert judges' were asked to evaluate the child's progress against the set objectives that relate to intervention. At the end of the first period the picture was unclear as to which of the strategies was proving the most effective, although the Multimodal Approach was marginally the most attractive when all other things were equal. However, by the end of the second period it became clear that the Multimodal Approach was seen as producing the best outcomes, with the Structured Approach being second, and the Unstructured Approach third. In terms of the objectives that had been set, it was concluded that the Multimodal Approach was the most useful in terms of giving a full and potentially useful assessment, but that the broad spectrum approach of the Multimodal paradigm required a considerable period of time in which to operate before notable gains could be detected. The implications of the outcome utilitities are discussed fully in the body of the thesis.

The thesis also contains a review of literature on the Multimodal paradigm, a review of literature on learning difficulties which seeks to place the research in the context of the seven modalities of the Multimodal BASIC IB, and there is also a review of the literature on research methodology which seeks to place the methodology adopted in the context of psychological experimentation in general.

The thesis concludes with discussions on the future applicability of both the Multimodal approach, and the Decision Theoretic Methodology to Child Guidance Practice in general.

CHAPTER ONE.

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A MULTIMODAL APPROACH TO PSYCHOLOGICAL INTERVENTION: A REVIEW OF THE LITERATURE.

A MULTIMODAL APPROACH TO PSYCHOLOGICAL INTERVENTION

1. INTRODUCTION

In 1965 a clinical psychologist whose roots were firmly in the behavioural tradition - which naturally tended to emphasise overt behaviours when dealing with client's problems - wrote a paper on the need to treat alcoholism from a multidimensional perspective - Lazarus (1965). Arnold Lazarus had become gradually more and more unhappy with the "narrowness" of approach adopted by traditional behaviour therapists, and was beginning to explore the possibilities of the behavioural psychologist adopting a much broader view. This marked the start of a process by which Lazarus would evolve and refine his notions about assessment and intervention with individuals, to the point of launching a movement which has become increasingly influential in America in the field of psychotherapy. Lazarus has coined the term Multimodal to describe this broad spectrum perspective, which has gone under the rubric of a therapy in the first instance, and more recently as an approach. It will be the intention of this review to look at the Multimodal approach critically, and to provide the reader with a descriptive, as well as evaluative overview of Multimodalism. Smith (1982) reported that, in the U.S.A., within the field of psychotherapy, Lazarus is one of the most influential and major figures, and more importantly, that multimodalism represented a major trend in applied psychological practice. Lazarus clearly does not hold this status in Britain, but his ideas are worthy of further examination, especially in applied psychological practice, where there is an on-going need for continued innovation. The Educational Psychologist finds himself torn by the

competing demands of assessment and intervention advice with individuals on the one hand, and the contextual framework of a systemic approach on the other. It may be possible that the broad spectrum coverage offered by the Multimodal paradigm provides, at least, part of the solution for psychologists caught on the horns of this dilemma.

2. THE MULTIMODAL PARADIGM

It will be the intention to consider, firstly, the historical perspectives operating in this instance, and secondly to consider the basic principles underlying the Multimodal position.

2.1 HISTORICAL PERSPECTIVES

As described in the introduction, the paper by Lazarus (1965) in which he describes a multidimensional approach to the treatment of alcoholism, represented the beginnings of a break from the narrow constraints of strict behaviourism for Lazarus, towards a more all encompassing methodology. Lazarus was unhappy about the restriction that behavioural approaches placed on the practitioner:

> ".... in their zeal for experimental rigour, and their desire to circumvent the quagmire of internal or subjective phenomena, many therapists have limited themselves to a rather narrow range of human experience."
>
> Lazarus (1976, p6)

Lazarus continued to develop his ideas, and the publication of a paper on the "Broad Spectrum Behavioural" approach to the treatment of agoraphobia, Lazarus (1966), challenged the narrow stimulus-response approach of traditional behaviourists, and elaborated

the notion of the importance of dyadic transactions or interpersonal processes, in the genesis and the maintenance of psychological problems. This generally expansive approach was further developed in the publication of "Behaviour Therapy and Beyond", Lazarus (1971), which has become an important introductory text to what is often described as "cognitive behaviour therapy". The broad spectrum behaviourist, while obviously focussing on the reinforcement schedules and the behavioural contingencies operating in any given situation, would also take acçount of interpersonal processes, attitudes and personal perceptions, as well as of a host of environmental and contextual factors which may be operating. Studies consistently showed, Lazarus (1976), that follow up of subjects revealed a high relapse rate for people who were exposed purely to behavioural methods. Where improvement had occurred, case notes consistently linked this to somewhat vaguer notions of the subject having "increased self esteem" or "an enhanced range of interpersonal and behavioural skills", and there was consistently a notion of synergy between behavioural and more obviously cognitive approaches.

There were two apparent and obvious strands to Lazarus' developing ideas. On the one hand, there was a conviction that the development of durable and worthwhile interventions with individuals requires rigorous and comprehensive follow up data. As Paul (1967) had previously suggested, the therapist has to continually ask the question as to what types of interventions, for what particular problems,and under what set of circumstances, will be effective with any given individual. Thus, the blanket application of behavioural

techniques is not enough, it is also important to consider the uniqueness of the individual in terms of both personal factors and context, and to try and match this with the variety of differing intervention strategies that may be adopted.

As well as this emphasis on follow up as a method to build a knowledge base about intervention effectiveness, Lazarus was also interested in developing a framework, or methodology, which would allow for the comprehensive and meticulous assessment of any individual. As will be elucidated in the next section of this review, Lazarus found this comprehensive framework in the seven modalities of the BASIC-ID, namely:
Behavioural factors; Affective processes; Sensory processes; Imagery: Cognitive processes; Interpersonal processes; Biological factors.

FOOTNOTE: Lazarus chooses the acronym BASIC-ID, where D is used to describe Drug related issues. This clearly has its genesis in the clinical setting, where drug therapy is often used as part of a treatment programme. But, as Lazarus himself clearly points out (Lazarus, 1976, 1981), this modality refers to the Biological Substratum which underpins all psychological functioning, and consequently, I find it misleading to use the initial 'D' in the acronym, and for that reason will always refer to this modality as the 'Biological' modality, and use the prefix 'B' in the acronym BASIC-ID.

In addition to providing a comprehensive framework within which to consider the psychological functioning of an individual, Lazarus also believed that subsequent interventions should refer to the identified areas of need across the BASIC-ID. To this end, Lazarus emphasises the importance of "technical eclecticism", Lazarus (1976). This is the concept favoured in the Multimodal approach, so that the practitioner can have access to a wide variety of therapeutic methods whose genesis might exist in widely disparate theoretical persuasions. This, Lazarus insists, is more than simple "multimodal" eclecticism - as Eysenck (1970) would tend to suggest - but systematic eclecticism, the benchmark for which is "What works for whom, and in what particular circumstances". Lazarus (1981, p5).

From this standpoint, the importance of follow up studies becomes crucial - if no assessment of effectiveness is adopted then technical or systematic eclecticism becomes meaningless.

In demonstrating the essential features of the multimodal approach, Lazarus adopts a generally case-study orientated approach which emphasises the comprehensiveness of the assessment and the technically eclectic interventionist strategy following from that.

Initially, with the publication of "Multimodal Behaviour Therapy" (Lazarus, 1976) the historical links with behaviourism were quite explicit. In what is probably the most comprehensive exposition of the multimodal position to date, "The Practice of Multimodal Therapy" (Lazarus, 1981),the overt link with behaviourism is somewhat played down - as the title suggests - although, because

of the clinical emphasis of the book, the word "therapy" to describe the multimodal practice if retained. However, as Lazarus (1981) points out, multimodalism is an overall approach, and not a therapy per se. It may, of course, suggest various differing therapeutic interventions in any given situation, but multimodalism itself is not a therapy. Some subsequent publications do retain this somewhat misleading term in their titles - most notably Keat (1979) and Lazarus (1981). Keat's book, "Multimodal Therapy with Children", Keat (1979), is - as will be discussed later - particularly misleading, and although in his most recent book, "A Casebook of Multimodal Therapy" (Lazarus, 1985) Lazarus retains the therapeutic notion, the descriptions clearly emphasise the fact that multimodalism offers the practitioner a frame of reference to work from. The idea of multimodalism as an approach is particularly well emphasised in a book by Brunell and Young (1983), "A Multimodal Handbook for a Mental Hospital". In this they demonstrate how the principles behind multimodalism can be taken as providing a rationalistic framework on which the whole care and therapeutic programmes in an institutional setting can be based. This particularly well emphasises the shift away from the more clinically orientated perspective towards a more psychoeducational approach. This shift in emphasis is also developmentally implicit in Lazarus' own writings on the subject (Lazarus, 1971, 1976, 1981, 1985), although at an explicit level they pay their dues to the clinical origins in Behaviour Therapy.

As the demands on practising psychologists for more effective help and support for distressed individuals grow, then the dangers of ill thought out eclecticism grows as well. The temptation of a

"flavour of the month" approach can be all too alluring, and the need for a framework which will keep a psychologist's thinking focussed is paramount. The Multimodal paradigm may offer a potential solution here, and the future development of the approach pioneered by Lazarus and his associates may well see a diversification into other areas. This particular study takes the emphasis away from an overtly clinical setting, and seeks to assess the effectiveness of the multimodal approach in a more obviously educational and social setting. The future evolution of the multimodal approach may well depend on its ability to accommodate a wide variety of contexts within which the applied psychologist may be working.

2.2. BASIC PRINCIPLES BEHIND THE MULTIMODAL PARADIGM

"The Multimodal orientation transcends the usual multifactorial or multidimensional approaches to assessment and therapy. It offers a systematic framework that ensures comprehensiveness without sacrificing detail. It provides a compass, a cognitive map, and a continuous cross check that promotes diagnostic accuracy and therapeutic efficiency. It encourages treating the whole person, and above all, it provides specified procedures for assessing and remediating intraindividual and interpersonal problems."
(Lazarus, 1981, p10).

When we come to consider human behaviour from a psychological perspective, we are forced to conclude that we are beings who act and react to situations - behave overtly, feel, sense, imagine, think, and relate socially to one another. These overtly

psychological processes rest on our biochemical/neurophysiological substrate - our physical bodies. As has already been pointed out, Lazarus (1982) suggests that, from such a conceptual standpoint, the human inidvidual's functioning can be considered in terms of:

1.	Behaviours (overt)	-	Be
2.	Affective Processes (feelings)	-	A
3.	Physical Sensations	-	S
4.	Mental Images	-	I
5.	Cognitive Thought Processes	-	C
6.	Interpersonal Relationships	-	Ip
7.	Biological Processes	-	B

Lazarus (1981) takes the initial letter of these seven modalities to spell out the acronym BASIC IB. Lazarus (1982) points out that when fellow psychologists and academics are asked which, if any, of the seven modalities are redundant, and which others may be added, he has yet to receive any meaningful criticisms or relevant additions. This is presented as prima facie evidence for the comprehensiveness of the systematic framework. However, can we find any other evidence from pyschological literature that would be basically consonant with Lazarus' model? Lang (1971) points out, for example, that human behaviour can be globally conceived as a tripartite response pattern which consists of verbal - cognitive, autonomic - physiological, and overt - motoric components. Lang sees these systems as distinguishable in a conceptual sense, but not intrinsically divisible, and also mutually interactive. Kwee (1981) takes Lang's tripartite system and considers it

as follows:

1. The verbal - cognitive component can be looked at as Cognitive thought processes (C), and non-verbal images (I).
2. The autonomic - physiological component can be differentiated into inner experiences and emotions (A), and sensory perceptions (S).
3. The overt - motoric component can be distinguished into overt individual responses (Be), and interpersonal responses (Ip).

Thus, by again adding the 'B' modality to suggest the Biological substratum as before, Lang's model can be subsumed under Lazarus' BASIC-IB, multimodal classification. Kwee (1981) also suggests that Ebbinghaus (1902) also understood these dimensions as forming the main areas to be considered in the psychological experimental study of human behaviour, and that they, together, constitute a framework for understanding the individual.

Lazarus (1976, 1981) also makes it clear that the seven modalities provide a conceptual framework only, and that they cannot be considered in isolation, but only in terms of providing a comprehensive map of the individual's functioning. While the seven modalities may be conceptually distinguishable, their fundamental nature is one of complex interactions. Lazarus suggests that in the clinical setting, the comprehensive assessment of an individual across the seven modalities of the BASIC-IB enables the practitioner to avoid the reductionist pitfall of fitting the client to intervention strategy. Lazarus (1981, p10) draws the

analogy between the multimodal perspective and music:

"The BASIC ID represent the fundamental vectors of human personality just as A B C D E F G represent the fundamental notes in music. Combinations and interactions of A B C D E F G (with sharps and flats) will produce everything from chopsticks to Mozart."

Thus, essentially, Lazarus is suggesting that every condition in human psychology - from the most basic to the most complex, can be accounted for by the comprehensiveness and the subtlety of interactions of the BASIC-ID. Thus, it is suggested, this offers a potentially dynamic and holistic view of human nature, in which the psychologist's understanding of the client requires access to the uniqueness of the individual's BASIC ID and its interactions.

Let us now consider some of the issues surrounding the multimodal paradigm in some more detail.

2.2.1 COMPREHENSIVENESS OF THE BASIC ID

Lazarus (1981) points out the significant differences between a multimodal approach, and what may be described as a conventional broad spectrum approach that many psychologists may adopt in their practice. It is pointed out that if any one modality - or more than one - is ignored, then an incomplete and distorted picture of the individual would be the result. A comprehensive assessment is a *sine qua non for effective subsequent intervention*, and, therefore, anything less than a complete 'map' of the individual's BASIC ID must be lacking.

Experienced and competent psychologists may well cover several modalities in an assessment - but rarely, if ever, all seven. Also, the interactive nature of modality functioning will rarely be stressed. In addition to this the reductionist nature of conventional assessment devices used by psychologists, both psychometrically based, and also criterion based, invariably tend to focus attention too quickly and reinforce the non-interactive nature of psychological processes. Lazarus (1981) also points out the danger of stressing commonalities in psychological process at the expense of individual differences. To ignore differences, or to describe them as insignificant may lead to overlooking significant factors that may account for some critical variance. Lazarus argues that the comprehensiveness of the BASIC 1B should help the practitioner avoid such oversights.

2.2.2 MULTIMODALISM AND TECHNICAL ECLECTICISM

The multimodal paradigm is not simply seen as an assessment framework which the practitioner can use early in an intervention phase, Lazarus also stresses that it should lead on to subsequent action. Lazarus (1981) is extremely sceptical about attempts to build comprehensive theories of human behaviour which make definitive statements of cause and effect, and which have a resulting narrow range of therapeutic tools. He argues that the benchmark for the use of any given intervention strategy lies in whether or not it has been effective in helping the distressed individual, and not in a slavish link to a given theoretical position. It could be

argued that such theoretical excursions into the domain of ultimate causation and definitive prescriptions of therapeutic interventions, remain largely speculative and unproductive. The current state of psychological knowledge does not permit the development of an academic and wholly accurate theory of human functioning. Nevertheless, the psychologist's view of causality will largely determine the selection of intervention strategies. One has to remain highly suspicious of what Rosen (1977) calls "psychobabble" - jargon phrases that arise, usually in inverse proportion to their usefulness. Within educational psychology practice examples would include 'psycho-motor deficiency'; 'figure-ground deficits'; 'encoding problems'; 'visuo-spatial difficulties etc. Such jargon, Rosen argues, is used either to cover up ignorance, to present a front of erudition to the uninitiated, to provide a vehicle for group identification and labelling, or to lend an air of mystification which can be all too alluring. Such a situation is not only unprofessional, Lazarus (1976) also argues that it retards the genuine advance of knowledge, as it breeds confusion and uncertainty. Lazarus urges practitioners to heed Occam's razor and to respect the principle of parsimony, in a manner that is arguably achieved by the multimodal approach, in which:

1. Unproductive jargon is kept to a minimum.
2. The sterile quest for ultimate causation is avoided.
3. A pragmatic, soundly based, problem solving interventionist approach is adopted.
4. Careful follow-up facilitates the productive advance of knowledge.

5. Intervention techniques are selected on the base of what works for whom and in what circumstances, regardless of the theoretical origin, such knowledge being built up through experience.

Lazarus (1976, 1981) coins the term pragmatic technical eclecticism to describe this problem solving approach which is applied to the given modalities of the BASIC ĪB, and which, because of the comprehensiveness of the multimodal assessment, maximises the likelihood of beneficial outcomes for the client.

2.2.3 THEORETICAL BACKGROUND TO THE BASIC ĪB

As has been pointed out, the seven modalities of the BASIC ĪB are offered as a coherent, comprehensive conceptual framework on which to consider an individual's psychological functioning. The seven modalities in themselves do not represent a theoretical description of human behaviour, they are merely useful descriptions. However, it would be erroneous to assume that this BASIC-ĪB framework taken in concert with Lazarus' insistence on pragmatic technical eclecticism when it comes to intervention programmes, implies no acceptance of a theoretical base to human behaviour underlying these processes. Lazarus (1981) identifies three theoretical components that would be active in human behaviour:

1. SOCIAL LEARNING

   Lazarus sees human behaviour as developing through the dynamic interplay between our genetic endowment, our physical environment and our social interactions. Ostensibly, Lazarus would align himself with the social learning theorists typified by the work of Bandura (1969, 1977).

2. PRIVATE EVENTS

While emphasising the importance of social learning, Lazarus also acknowledges that private events - thoughts, feelings, images and sensations - play an important role in shaping individual personality. Ellis (1962) points out that people often respond not to the real environment, but to their perceived environment. As Lazarus (1981) suggests, this perceived environment may be a function of both conscious and unconscious processes. However, Lazarus stresses that an acknowledgement of unconscious processes does not imply an attachment to a particular theoretical line - Freudian, for example. It is simply seen as an acknowledgement of the fact that people are capable of truncating their own awareness, mislabelling their affective responses, and losing touch with themselves and others in a variety of ways, Lazarus (1981). Shevrin and Dickman (1980) also support this view. In a survey of several diverse fields of empirical research they found evidence that "nonconscious psychological processes" are a conceptual necessity. Lazarus emphasises that the multimodal practitioner will simply accept this reality without seeking to attribute ultimate causative explanations in terms of some global theory.

3. SOCIAL SYSTEMS

Contextual and environmental factors are also seen as being relevant determiners of behaviour. Lazarus (1981) acknowledges the fact that individuals function as part of a social system -

as part of a culture and society in general, and in more specific terms, at home, at work, in school etc. Thus, when considering an individual's modality profile across the BASIC ID, the context in which the individual's psychology is being played out has to be borne in mind - especially when planning interventions.

In summary, Lazarus is suggesting that an individual's BASIC-ID profile is built up by a dynamic combination of social learning theory, unconscious processes and contextual factors. Ultimately, when it comes down to applying therapeutic techniques across the BASIC ID, the multimodal practitioner is not tied to any particular school of thought. He is a pragmatic employer of the technically eclectic approach described before. Thus, unlike other eclectic psychologists who try to rationalise processes at a causative level using theories that are mutually incompatible, the multimodal practitioner will remain above these fundamentally sterile theoretical debates, and simply use the BASIC ID profile to guide interventions - regardless of their theoretical origins. Obviously, at a purely theoretical level where fundamental cause and effect processes are being examined, eclecticism cannot be condoned, but this is not the point for the multimodal practitioner. The systematic use of eclectic processes over a period of time, where all interventions are closely monitored, within the BASIC ID framework, it is suggested, can add to knowledge in a very practical sense, and hopefully alleviate a lot of psychological suffering in the process.

2.2.4 MODALITY INTERACTIONS ACROSS THE BASIC ID

Lazarus (1976, 1981) continually stresses the importance of considering the interactions across modalities. Lazarus (1981) shows in some detail how the multimodal schema can be used to 'track' such interactions, in a meaningful manner. The best way in which to consider such modality interactions would be through a hypothetical example. Consider the following description given by a child about being asked to read aloud in class:

"When the teacher asked me to stand up and read the page in the book, I imagined all the class laughing at me. I started feeling hot and shaky. I knew that I couldn't read the page, so I shouted at the teacher, threw down the book and ran out of the room."

(Actual description from case notes of a child referred for Learning Difficulties to the Educational Psychologist.)

A psychologist adopting a conventional assessment model would probably conclude - quite reasonably - that the child's reading difficulty was directly responsible for the emotional outburst. The multimodal practitioner, on the other hand, would consider the incident in terms of interactions across the modalities, thus:

> The response to the anxiety provoking situation starts in the Imagery modality, (imagined all the class starting to laugh); it then moves to the Sensory modality, (feeling hot and shaky). it then moves on to the Cognitive modality, (knew that couldn't read page); and finally manifests itself in the Behaviour modality (shouting, throwing down book, running out of the room).

Thus, the multimodal schema allows the practitioner to understand the nature of an emotional crisis. In this example the emotional outburst moves across the modalities from Imagery - Sensation - Cognitive - Behaviour. Lazarus (1981) terms this the 'Firing Order' across the modalities; i.e.: firing order in this instance is I - S - C - Be. This would be consonant with the views expressed by such writers as Plutchik (1980), who demonstrated that when emotions are triggered by some stimulus, an internal evaluation process takes place within the individual. Lazarus (1981) takes this issue further by reporting that clinical findings point to the fact that therapeutic interventions are more effective if they match the initiating modality. Thus, in the example given, if therapeutic intervention were to be considered to help the child's emotional difficulties, then a technique based on Imagery would be the preferred starting point, as opposed to a technique based on simple behavioural schedules, for example. Lazarus (1981) also reports that many people appear to have reasonably well defined and predictable 'firing orders' that tend to remain relatively constant across situations. He stops short of suggesting that this may take on the status of a trait, but does not dismiss the possibility either. Thus, the multimodal schema not only allows for consideration of an individual's functioning within the seven modality areas, but also gives the practitioner possible access to how subtle interactions occur.

2.2.5 THE MULTIMODAL PERSPECTIVE - SUMMARY

Having looked in some detail at the basic principles and ideas contained within the multimodal perspective, it will be useful to briefly summarise the situation as follows:

1. Human psychology can be perceived in terms of the seven interdependent and interactive modality vectors of the BASIC IB.
2. A BASIC IB analysis provides a comprehensive and all inclusive model of human psychological processes.
3. The theoretical underpinning of human behaviours lies in a dynamic interaction between social learning theory, private events and contextual factors.
4. The multimodal practitioner adopts an intervention stance based on pragmatic technical eclecticism, in which the utility of a technique is paramount as opposed to its theoretical genesis.
5. The multimodal paradigm offers a genuinely useful holistic framework for considering an individual's psychological functioning. Not only does it stress the necessity to consider all seven modalities across the BASIC IB, it also allows for consideration of modality interactions, by considering 'firing orders'.

3. THE MULTIMODAL APPROACH - A CRITICAL EVALUATION

3.1 INTRODUCTION

Having considered the historical background and the fundamental principles underpinning the multimodal approach, it is clearly of some importance to consider Lazarus' ideas more critically. There would appear to be two levels at which this debate may be considered:

1. There is an on-going debate between protagonists taking up varying positions regarding some of the more fundamental issues and assumptions that exist in the multimodal perspective.
2. At a slightly lower level of generality, there are issues which emerge from practitioners using the multimodal perspective in a variety of differing settings and the implications that this may have for practitioners in general.

3.2 FUNDAMENTAL ISSUES IN THE MULTIMODAL PERSPECTIVE

Perusal of the literature surrounding the multimodal perspectives highlights five possible areas of debate:

1. The Comprehensiveness Assumption.
2. The 'separate-but-equal' Assumption relating to the modalities of the BASIC ĪB. The assumption that the modalities of the BASIC ĪB are separate and equal.
3. The theoretical debate.
4. The debate on Therapy V Framework.
5. The Effectiveness debate.

We can consider each of these areas of debate in turn.

3.2.1 THE COMPREHENSIVENESS ASSUMPTION

As was stated earlier in this review of the Multimodal position, Lazarus emphasises the comprehensive coverage that the seven modalities of the BASIC-ID give when considering human functioning.

Although Lazarus (1981) acknowledges that consideration of an individual's BASIC ID takes no explicit account of contextual factors, some criticism has been made regarding this apparent "Lack of comprehensiveness". Nathan and Harris (1980) strongly suggest that psychopathology and society in general, are inextricably bound together. Lazarus' response to this criticism tends to be to suggest that sociocultural, political, and certain environmental factors which may influence an individual, generally fall outside the sphere of temperament and personality. Again, Lazarus' pragmatism comes to his aid when he suggests that the individual's BASIC ID has always to be considered in the context of environmental factors, and appropriate account taken of them when considering treatment or intervention. This pragmatic acceptance of the situation would seem to be about as far as Lazarus could reasonably go on this issue. It is, after all, a criticism that could be laid at the door of any individually orientated psycho/educational intervention strategy.

Wilkins and Thorpe (1978) are less happy that Lazarus appears to ignore the spiritual sphere of human existence, and clearly are not convinced by Lazarus' (1973) claim that such components can be summarily subsumed under the cognition and affective modalities.

Lazarus, however, would appear happy with this arrangement, and it is again perhaps reasonable to say that this would be a potential

criticism of many other forms of psychological intervention.

At a more specific level, Beck (1977) is less happy with the notion that assessment across the BASIC ID will provide the practitioner with a comprehensive assessment of an individual. Beck likens the process to the medical practitioner taking a comprehensive case history of a patient. In practice, the amount of data that may be collected from any one individual is infinite, but time available is all too finite. Thus, a blanket coverage of all the identified categories will, by definition, thin out the amount of exploration that is possible in any one category. Havens (1973) makes a similar point in relation to categorical case history methods, by suggesting that the effect of categorization may also limit an investigation - when time is limited and there are so many points to cover, the desire for global thoroughness may lead to superficiality.
Beck (1977) points out a corollary of this point which may, in his opinion, warrant more thorough investigation and analysis. This he refers to as the 'Cumulative Effect Assumption' which implies that therapeutic success is correlated with the number of modalities of the BASIC-ID that are explored. Beck suggests that it is perfectly reasonable to hypothesise that success will be more noticeable when efforts are concentrated in particular modalities.

Lazarus (1976, 1981) is fundamentally unrepentant in his view that all seven modalities across the BASIC ID will give a comprehensive picture of the individual, and that it is important that no modality is ignored. In his more recent writings, Lazarus (1981, 1985), the concern that Beck has that thoroughness brings with it the danger of

superficiality is dealt with to some extent. Lazarus suggests that when a particular therapeutic intervention programme appears to be getting "bogged down" in a particular modality, a useful strategy is to employ a second order BASIC ID, focussing on the problem(s) identified in the modality where the 'block' appears to be occurring For example, if the multimodal therapist identified a blockage in the 'Imagery' modality, the subject would be asked to consider the imagery issue in detail, and the therapist, through structured interviewing, for example, would start to build a new BASIC-ID around that one issue. This, Lazarus argues, will allow progress to be made in therapy, and the 'block' to be overcome. Thus, it is argued, the multimodal technique does allow for a more detailed study in depth of any presenting problem, and not only that, it does so within a consistent and coherent framework. Lazarus argues that, in principle, it would be possible to adopt third, fourth ..... nth order BASIC ID analyses should it be seen as appropriate, although this would rarely be required. Brunell (1983) also suggests that an advantage of the multimodal schema is that it shows up where information may be lacking across the BASIC ID, and this information may prove as important as any other for the practitioner.

Lazarus (1981) counters the criticism of the Cumulative Effect Assumption cited by Beck, by pointing out that the multimodal practitioner will select priorities within the BASIC ID, but that is not necessarily done at the expense of other identified areas which may simultaneously receive attention. Other writers, notably Brunell (1983) would be particularly supportive of Lazarus in this debate. Brunell points out that a thorough and properly conducted

BASIC ID investigation in no way limits the clinician as it directs thinking towards fruitful and productive intervention strategies.

More recently, Lazarus (1984) has added a further twist to the debate regarding the comprehensiveness assumption. He suggests that while in theory, most practitioners agree that every client is a unique person, and that intervention has to be tailored accordingly, in practice, the client is too often fitted to ill-conceived intervention models. This results in over generalisations and psychotherapeutic fads. Lazarus argues that the multimodal paradigm provides the comprehensiveness and specificity to arrive at individually tailored programmes. He argues that the recent emphasis on accountability and cost effectiveness in psychology highlights the need for the practitioner to develop specific answers to specific questions, and this the multimodal perspective is designed to achieve.

This comprehensiveness Vs specificity debate may well require to be considered in detail with well designed follow up studies.

3.2.2 THE SEPARATE BUT EQUAL ASSUMPTION

Beck (1977) suggests that the multimodal approach assumes that the seven modality categories of the BASIC ID are not only essentially independent, but carry the same degree of importance. Beck goes on to suggest examples where this does not appear to be the case - e.g.: imagery has traditionally been viewed as a type of cognition, and visual imagery and verbal cognitive thought processes are closely intertwined. Beck argues that since interventions in the multimodal

perspective have to "match" the presenting difficulty - e.g.: behavioural methods for problems identified in 'Be' modality, and so on, this allows the multimodal approach to fall into the trap it sought to avoid - creating a model that obscures rather than facilitates insight into therapeutic questions. Beck also argues that the modalities cannot be equivalent, as they represent varying degrees of abstraction. For example, Beck suggests the Behaviour and the Biological modality are probably the most concrete, whereas Sensory modality is more abstract, and cognition and imagery more abstract still. Thus, in effect, argues Beck, the supposed linear equivalence of the modalities is in fact a vertical hierarchy of abstractions. Beck believes that subsequent intervention strategies are frequently a function of the level of abstraction. Thus, for example, Behavioural or Medication interventions are more 'concrete' for both practitioner and client, and are more liable, accordingly, to be chosen. One also senses a covert - though never stated - assumption in Beck's paper, that the more concrete the intervention the greater the likelihood of successful outcome.

In answering such criticism Lazarus (1981), indicates that at no time are the modality categories seen as mutually exclusive, and indeed, the 'firing order' mechanism is used to show the highly interactive nature of the processes across modalities. Brunell (1983) goes further in stating that one of the major strengths of the multimodal system is that it provides higher 'visibility' with which to examine such interactions across components of the personality. It is fair to say that even some of Lazarus' more vociferous defenders - most notably Keat (1981) - do their best to undermine

the multimodal position by adopting a wholly pragmatic approach in reducing multimodal perspectives to simply "acronym" perspectives - e.g.: changing the name and nature of the modalities, which, rightly, adds fuel to the fire of critics like Beck. However, Keat's contribution to the debate will be considered in more detail later.

As far as the point made by Beck regarding the vertical hierarchical abstraction represented by the modalities is concerned, Lazarus (1981) does not particularly see this as an issue. It is pointed out that in terms of intervention, prioritising decisions often have to be made, and very often these will come in at the more concrete level - e.g.: behavioural strategies, but as Brunell (1983) points out, it is frequently necessary to attend to such concrete goals first - e.g.: it is difficult to deal with socialisation problems or problems of self image in an individual who does not maintain satisfactory minimum levels of cleanliness. This should not, however, cloud the practitioner's awareness of the more fundamental and often psychologically more subtle issues, and, it is argued, the insistence on the full multimodal coverage of the client's functioning will avoid such a problem. Thus, using the abstraction-concreteness continuum may be useful when setting priorities for subsequent intervention, but it adds nothing to the assessment phase, where all relevant factors should be considered and recorded. At best, Lazarus sees Beck's concern acting as a useful marker when considering intervention; at worst, he considers the criticism irrelevant, and essentially missing the point about the nature of a multimodal assessment.

3.2.3 THE THEORETICAL ISSUE

The whole area of theoretical issues is one in which there is a considerable amount of heated debate - verging, it would seem, on the acrimonious at times - especially between Lazarus and fellow emminent clinical psychologists. Zilbergeld (1982) points out that psychotherapy has traditionally been theory-rich and method-poor, and he applauds Lazarus' attention to methodical pragmatism, but, on the other hand, admits that Lazarus' lack of attention to theoretical matters may well cause some anxiety among psychologists wishing to understand processes. Wolpe (1971) is very sceptical of any attempt to step outside the theoretical restrictions of behavioural theory, suggesting that this may lead to semantic muddle. Eysenck (1970) is even more dismissive of Lazarus and his evolving position, describing it as ... "a mish-mash, a hugger-mugger of theories, practices and outcomes; a gallimaufry and charivaria of inconsistent and contradictory bits and pieces, uncontrolled and untestable, held together by a thin string of clinical insight and experience."

Clearly, Eysenck has little time for Lazarus' ideas. Beck (1977) suggests that Lazarus views theory as a structure that locks the practitioner into a particular belief system, and thereby impedes the innovation and versatile application of new ideas and techniques. While agreeing that much of Lazarus's skepticism is justified, Beck continues to insist that in dealing with the general complexities of human behaviour, it is important to have some "map of the terrain", rather than to simply rely on a mass of detail categorised into the seven modalities of the BASIC ID. Beck feels that this general atheoretical position leaves the practitioner with no guide as to what interventions to use, and when to use them. In place of such a

general directionality provided by theoretical considerations, Beck is not happy with what Lazarus offers - Pragmatic Technical Eclecticism. Meichenbaum (1977) picks up this theme, by suggesting that Technical Eclecticism is a catchword ostensibly providing the criteria for the selection of treatment models. Meichenbaum (1977) points out that although Lazarus continues to suggest that there is a rationale behind the selection of strategies, none is ever offered, and that, in essence, what is being described comes down to pure subjective clinical judgement. Such an atheoretical position provides no context in which to understand the psychological mechanisms that contribute to change, and how the modalities of the BASIC-ID interact. ("By the way, what is a modality anyway?", asks Meichenbaum.) Meichenbaum feels that this preoccupation with pragmatic technical eclecticism distracts the serious student of human nature away from the need to pursue the theoretical analyses of the mechanisms that contribute to change.

Ostensibly, the anxiety that most of these writers have regarding Lazarus' position seems to stem from a commonly held belief that Lazarus promotes the multimodal approach based on his not inconsiderable - and it would appear, well deserved - reputation as a skilful clinician, while at the same time undervaluing the theoretical considerations behind a smoke screen of technical eclecticism.

Lazarus, as one would expect, remains unrepentant. He points out (Lazarus, 1981) that clearly, in scientific research, eclecticism cannot be condoned - it can only lead to a plethora of contradictory notions and ideas. This, it is argued, is a valid position to take

up in the laboratory setting, but in clinical practice the withholding of potentially helpful interventions is both unprofessional and inhumane. Equally, the same criticism could be made of the promotion of potentially harmful interventions. Both such options would require to be considered in a traditionally scientific theoretical evaluation of intervention strategies. Because, as Lazarus (1985) says, the multimodal approach is pluralistic and personalistic, it can be sensitive to the multileveled and multilayered manifestations of human difficulties. Clinical effectiveness is fundamentally predicated on the practitioner's flexibility, versatility and technical eclecticism. At this point, Lazarus, stresses the difference he sees between the technical eclectic and the theoretical eclectic. The theoretical eclectic may subscribe to theories or disciplines that are incompatible and often mutually exclusive. This, as Messer and Winokur (1980), point out, ends up in an agglomerate of incompatible and contradictory notions. On the other hand, the technical eclectic, uses many differing techniques drawn from different sources without adhering to the theories or systems that spawned them. Lazarus believes that the anxieties in this area described by writers such as Beck and Meichenbaum, arise from a fundamental confusion. Smith (1982) indicated that the majority of practitioners in the United States are eclectic and multimodal in outlook. While accepting that this represents a large scale of sympathy with his ideas, Lazarus does not believe that the majority of such practitioners are genuine multimodal practitioners. The difference he alludes to is the

insistence in his schema that the practitioner be thoroughly systematic, and remain constantly aware of the client's needs and accommodate them in a systematic way within the framework of the BASIC ID (Lazarus, 1976, 1981, 1984).

Lazarus believes that many of the criticisms of Beck and Meichenbaum could fairly be laid at the door of the inconsistent practitioner who espouses a vague eclecticism and claims a multimodal perspective, but that the distinguishing feature of genuine multimodalism is its comprehensiveness - subsumed under the BASIC-ID - and its systematic methodology, which, at the end of the day, is both scientifically and professionally consistent and defensible. At no point does Lazarus disagree with Beck's assertion that therapeutic interventions should be opened up to systematic study, he simply sees the multimodal framework with its consistency and comprehensiveness, as being the ideal vehicle to do this. Zilbergeld (1982) takes up Lazarus' position quite rigorously in stating clearly that - "theory is not necessary for effectiveness" (Zilbergeld, 1982, p86), but he also points out that psychologists can no longer get by with all-purpose interventions and assessments which yield little useful information about effectiveness, and that the multimodal perspective provides a framework which can point in the direction that psychologist's should be going in avoiding these pitfalls, and in building a systematic knowledge base for effective therapeutic intervention.

3.2.4 THE THERAPY/FRAMEWORK DEBATE

The issue of the extent to which the multimodal approach can be considered a therapy as opposed to a systematic framework, is one which has been fuelled by Lazarus' own apparent inconsistencies in the issue. His major publications on the subject (Lazarus 1976, 1981, 1985) all are suggesting that multimodalism is in fact a therapy - although as we have seen, after his first publication, Lazarus (1976), he drops the qualifying adjective "behaviour", and we are left with the more generic term "multimodal therapy". This situation is in some conflict with comments by Lazarus (1981, 1982) that multimodal therapy is not a new system of therapy, but rather a way of viewing clients that provides valid guidelines for intervention. Wilkins and Thorpe (1978) take up this debate by suggesting that the multimodal paradigm is neither a coherent conceptual system, nor a behavioural approach, nor even an approach to therapy. They suggest, on the other hand, that it is a misnomer for thorough assessment practices and a "multimuddle" of therapeutic techniques. Wilkins and Thorpe (1978) make the same point made by Beck (1977) when they suggest that the modalities function at varying levels of abstraction, and, as such the BASIC-ID cannot have systematic integrity. They further cite the "acronym therapy" approaches of writers such as Keat (1976) to support this view. Criticism is also made of the use of the word "behaviour" as a qualifier in Lazarus' 1976 publication - "Multimodal Behaviour Therapy". They point out that many of the techniques proposed do not meet the criteria for being "behavioural", - observable, publicly verifiable and empirically validated - a point apparently subsequently accepted by Lazarus by his tacit dropping of

'behaviour' from descriptions of multimodalism. Wilkins and Thorpe (1978) also point out that multimodalism shows an almost exclusive concern for thorough, comprehensive assessment - a laudable and desirable trait in itself - but that when the issue of therapeutic intervention arises it is seen as an empirical question for evaluative outcome studies. Thus, it is argued, multimodalism can be seen as a comprehensive assessment system and framework for data gathering, and as such, cannot be considered a therapy per se. It is pointed out that other writers (e.g. Kanfer and Saslow (1969) Kanfer and Saslow (1969) make a distinction between taxonomic systems aimed at classifying client characteristics (assessment), and taxonomic systems aimed at classifying therapeutic procedures (interventions), and they suggest that multimodalism broadly speaking belongs to the former of these taxonomies. Wilkins and Thorpe (1978), do however, acknowledge that the multimodal schema does provide a potential "bridge" between assessment and intervention, and does have the basis of an overall taxonomic framework, but that this is something quite distinct from a therapy.

It would seem to the present writer that this is not an issue which Lazarus has dealt with very satisfactorily, and in many respects the taxonomic framework suggested by Wilkins and Thorpe does seem to provide a more rational overview of the whole schema. Schacht(1982) also clearly has difficulties with the distinction between a 'system' and an 'approach'. He accuses Lazarus of a 'remarkable bit of semantic juggling' when he declares that, ... "multimodal therapy is not a system, but that rather it is an approach", Lazarus (1981 pix).

He asks the rather pertinent - and, from Lazarus' point of view, embarrassing- question "What is the distinction between a system and an approach that provides systematization?" Certainly, using the multimodal approach in an applied Educational Psychology setting which is more overtly Educational than therapeutic, the emphasis has always been on the utility of the approach as a framework for assessment and subsequent intervention, rather than as a therapeutic endeavour in its own right.

3.2.5 THE EFFECTIVENESS DEBATE

As Lazarus (1976, 1981, 1985) continually insists, the thrust of the multimodal approach is always a consideration of what intervention works for what individual in what particular circumstances. The insistence on systematic eclecticism leads to a fundamental issue of evaluating outcome. Indeed, Lazarus builds his whole multimodal house on the foundations of effective help for distressed individuals, and if this is removed or cannot be shown to exist, the "house's" long term stability will - to say the least of it - be undermined. Meichenbaum (1977) is unhappy with the approach which advocates the use of strategies in a "suck it and see" manner, especially as he points out there is often no empirical evidence offered - some clinical judgement - as to the effectiveness of any given strategy. Schacht (1982) is also somewhat scathing of the references that Lazarus makes (Lazarus, 1981) to personal outcome studies (unpublished), the information about which would give the empirically minded clinician precious little to chew on. All the major publications on the multimodal position to date (Lazarus 1976, 1981, 1985, Keat 1979, Brunell and Young 1982) all rely heavily on the case study model to

promote and describe the features of the multimodal approach, and, of course they essentially lay themselves open to two obvious major criticisms. On the one hand, any case study presentation has, by its nature, to be selective, and therefore not open to balanced evaluation. On the other hand, the nature of the case model presentations is such that successful outcome has to be inferred by the reader, or clinical judgement is called in again. Equally, this does not lead to balanced evaluation either.

An on-going debate between Wolpe and Lazarus also addresses this issue of outcome evaluation. Wolpe (1982) cites a review by Lazarus (1971) which reported that of 100 cases followed up, a 36% relapse rate was found. Wolpe (1982) takes these findings as evidence to show that multimodal therapy is much less successful than traditional behaviour thrapy, which has - in Wolpe's studies - a relapse rate of approximately 3%. Not only that, Wolpe suggests that multimodalism also runs the risk of diluting behaviour therapy, hence weakening the impact of any behavioural intervention used under the multimodal umbrella. Lazarus (1983) suggests that Wolpe (1982) was guilty of gross distortion. He points out that the results alluded to by Wolpe pre-dated the formulation of the multimodal paradigm (Lazarus 1973) and that Wolpe was guilty of misleading readers by suggesting the 36% relapse rate related to multimodal therapy, when in fact it related to behaviour therapy, and in itself provided the impetus for the expansion of behaviour therapy towards the more comprehensive multimodal schema. Lazarus also questions Wolpe's claim of 3% relapse rates with traditional behavioural approaches, but offers

no concrete evidence on this save his own 36% rate. Wolpe (1984) responded to this paper by Lazarus, by questioning Lazarus' assertion that the 36% relapse rate related to traditional behavioural approaches, and goes on to suggest that even in 1971, Lazarus was adopting what amounted to an "early version" of multimodalism, and that the results obtained merely served to provide an early warning of the misguided nature of Lazarus' efforts. Again, Wolpe quotes studies of his own (Wolpe, 1958) and Paul (1969) to support the efficacy of a strict behavioural approach, which he sees as an essential "controlling discipline" in any therapeutic endeavour. Again, Wolpe challenges Lazarus to supply procedural details surrounding the 36% relapse rate.
Lazarus (1985) again responded by insisting that although he may have been practising what he called - "multidisciplinary, multiform and multidimensional assessments and therapy, this was not the same as a multimodal perspective, as it lacked the comprehensiveness and systematisation of the later developed multimodal system. As Lazarus (1985, p1418) says, "all multimodal therapists are eclectic, but not all eclectic therapists are multimodal."

This whole debate is somewhat characterised by a lot of semantic sparring, and claim and counter claim which does appear to cloud the substantive issue - how effective is a multimodal approach? Lazarus ends this paper by an exhortation to .... "A dispassionate accounting of technique effectiveness ....", Lazarus, 1985, p1419).

It has to be said that this "dispassionate accounting of technique effectiveness", appears singularly lacking in Lazarus's writings,

and those other practitioners who espouse the multimodal approach. This is perhaps not surprising. Unlike Wolpe, for example, who may be interested in the replication of a highly detailed and specific technique (e.g. systematic desensitization), in situations where outcomes can be readily monitored, Lazarus, in choosing to adopt a highly pluralistic and individualistic model, runs into all the difficulties of setting up conventional research design strategies which are fundamentally designed to allow for individual variable manipulation with a large subject sample group, under controlled conditions. Lazarus would appear to accept these difficulties, although he does hold out hope of creating a longitudinal research design strategy that may answer some of these questions, Lazarus (1982).

At the end of the day, Lazarus prefers to adopt the stance of the committed clinician whose main concern is the relief of individual human misery and unhappiness, even though the outcome evaluation of this will remain largely subjective and a matter of clinical judgement. It is hard to argue against such a pragmatic and humanistic attitude!

One of the main thrusts of the piece of research reported in this thesis, is an attempt to evaluate, in a manner that is meaningful to the applied psychologist and the consumers of his skills, the usefulness or otherwise of the multimodal approach - it is not easy!

3.3 THE USE OF THE MULTIMODAL APPROACH IN OTHER SETTINGS

Another - although less substantive - measure of the usefulness of the multimodal approach comes from considering the extent to which Lazarus' ideas have influenced practitioners in related fields. If one adopts the modus operandi that you cannot fool all of the people all of the time, then the extent to which other professional psychologists have adopted the multimodal approach in their own practice will provide some measure of the extent to which Lazarus' ideas are influencing mainstream practice in a valuable way.

3.3.1 THE MULTIMODAL APPROACH IN INSTITUTIONAL SETTINGS

One of the most interesting developments of the multimodal approach has been examples of where the BASIC-IB framework has been used to provide not only a model for individualised assessment, but also a contextual framework on which the institution would operate. It would appear that in a clearly delineated environment, the multimodal framework provides a useful organisational tool which can dovetail more readily with traditional individually based assessments. The most notable example of this is the work of Brunell and Young (1982), where they describe the organisation and operation of a mental hospital based on the multimodal perspective. This describes in detail how, starting from the multimodal assessment of the individual the various structures and facilities of the hospital are developed in a coordinated and structured fashion flowing from the implications of the BASIC-1B profile.

Roberts, Jackson and Phelps (1980) take the multimodal perspective from the individual point of view, and show how this can be used to

organise a whole area of clinical service delivery. Most especially, they focus on the administrative and organisational issues that emerge from taking this perspective, and they report that the multimodal approach was an extremely helpful heuristic in scrutinizing and organising service delivery in a clinical day treatment centre. O'Keefe and Castaldo (1980) report the use of a multimodal approach in a Children's Home. Because of the essentially interdisciplinary nature of the work in such a child care setting, the need to adopt a methodology which would facilitate such a team approach was recognised. The Multimodal approach particularly lent itself to such an undertaking, being used to delineate individualised assessments and intervention plans, and subsequently to integrate the work of care staff, social workers, psychologists, psychiatrists, teachers, and other professionals, in line with this assessment. It was also found to be a useful model in planning the modification of the child's actual environment, and also in setting a framework around which the organisational structures of the home would be built.

In a more overtly medical context, Richard (1978) suggests that the multimodal approach may be a highly useful model for integrating all aspects of Behavioural Medicine. He suggests that, in an organisational setting, the multimodal framework could provide a coherence which would be of value in placing Behavioural medical practice in a context with the more overtly physical interventions. Case examples are given as illustrations, of a patient suffering hypertension, and a patient suffering migraine headaches. A related study by Beaty (1980) with patients exhibiting stuttering problems

would also fit into this framework. Richard believes that Lazarus' model also presents a method of integrating clinical research with clinical practice, both at the individual and the organisational level.

3.3.2 THE MULTIMODAL APPROACH WITH CHILDREN

There would appear to be two reasons for considering the multimodal approach with children under this separate heading. On the one hand, the issues associated with dealing with psychological difficulties with children are somewhat different than is the case with adults. Children are often quite unwilling participants in the intervention and assessment process, and therefore often present the practitioner with quite distinctive problems. The facility with which the multimodal perspective shifts to accommodate these factors is an interesting issue in itself. Secondly, as the central focus of this research study considers working with children, it is clearly important to consider the specific literature in this area in more detail.

Lazarus' own background is clearly with adult clients in an overtly clinical setting, and although children do get referred for psychological intervention through clinical settings, it is more often that the child's difficulty will be manifesting in an educational and social setting, and will more often than not, require to be dealt with in such a context.

In Lazarus' first book on the multimodal approach - "Multimodal Behaviour Therapy" (Lazarus, 1976) - there is a chapter by

Keat (1976,p116) which deals for the first time with a multimodal approach to children's problems. Keat presents two interesting case studies which demonstrate quite well how the multimodal approach is useful with children. In view of this relatively auspicious introduction, it was with considerable concern that a subsequent book by Keat (1979) was met - "Multimodal Therapy with Children". In this publication, Keat manages to totally misrepresent Lazarus' position, and provides critics of the multimodal paradigm with considerable ammunition. Keat makes the error of assuming that the Multimodal approach is merely a form of "Acronym Therapy", and procedes to randomly alter the seven modalities of the BASIC-ID to produce a new acronym, 'HELPING'. Keat re-defines the modalities as:

H	-	Health	(Biological Modality)
E	-	Emotions	(Affective Modality)
L	-	Learning/School	(Sensation, School* Modality)
P	-	People-Personal Relationships	(Interpersonal Modality)
I	-	Imagination-Interests	(Imagery Modality)
N	-	Need to Know - Think	(Cognitive Modality)
G	-	Guidance of Behaviour	(Behaviour Modality)

*FOOTNOTE

Keat (1976), had previously added "School" to the sensation Modality - the only good reason for this seeming to be that they both start with the letter 'S'.

This change in acronym to HELPING serves to sow confusion worse confounded. Firstly, there is no apparent logic behind the change, save that of producing a catchy and hopefully descriptive acronym (HELPING). Secondly, the juxtaposition of elements within certain modality categories - most notably Imagination and Interests - again is based on the spurious rationale of fitting the acronym.

Keat's ad hoc approach has had the added disadvantage that it may well have turned gifted and creative child psychologists away from the multimodal perspective before they ever have access to the more reasoned thinking of Lazarus himself. Lazarus (1981) takes Keat to task over this issue, but in view of the dis-service Keat has done in promoting the multimodal approach with children, his admonitions are mild in the extreme.

Notwithstanding the problems created by Keat, there is some evidence that practitioners do find the multimodal perspective a useful and valid one to adopt in working with children. The previously mentioned paper by O'Keefe and Castaldo (1980) points to the utility of the approach in a Children's Home setting. Seligman (1981) reports the multimodal work done with older high school students. Initial assessment and follow up data attested to the usefulness of the approach compared with test structured approaches. Starr and Raykovitz (1982) have developed what appears to be a useful Multimodal Interview Schedule for Children (MISC), although it has the distinct disadvantage of using Keat's HELPING acronym. However, the questions in the inventory are readily restructured into the BASIC-ID format. Other reports which appear using the multimodal

perspective with children include Edwards (1978), in the successful treatment of an insect phobia with a child using a multimodal approach Gerler & Keat (1977) in using the BASIC ID as the basis of collaboration between teacher and psychologist in the case of setting up a remedial reading programme, and Green (1978), on the use of the multimodal approach to help children deal with divorce in the family. A special edition of the Journal, "Elementary School Guidance and Counselling" (1982, Vol.16, No.4), is given over to issues of working multimodally with children. Again, Keat's influence is clear here, as the predominant use of the multimodal approach is through the HELPING, rather than the BASIC ID idiom. However, it remains clear, that with certain dedicated and talented practitioners the adoption of the multimodal approach to the work with children enhances and facilitates the whole intervention process.

Again, as with Lazarus' own work, the published research in the whole area of the use of the multimodal approach with children relies on the selective use of case studies, with all the problems that this entails for generalisation and evaluation.

3.4 SUMMARY

As Zilbergeld (1982) points out, Lazarus remains consistent to a fault in his objective to help clients make desired changes in their lives as rapidly as possible - everything else can be sacrificed in the process. In spite of the criticism laid at the door of the multimodal perspective by eminent researchers and clinicians, and in spite of the potential sabotage by supporters

of the multimodal position, such as Keat, Lazarus remains a strong force to be reckoned with, and the pragmatic technical eclecticism of the multimodal approach remains attractive to both practitioners and clients alike.

In spite of the shortcomings - and clearly there are some - the multimodal approach warrants consideration as a useful methodology in the armoury of an applied educational psychologist. In the following Sections the needs of the applied psychologist will be considered in more detail, and the potential utility of the multimodal approach within that context will be examined.

4. THE MULTIMODAL PERSPECTIVE AND EDUCATIONAL PSYCHOLOGICAL PRACTICE

4.1 INTRODUCTION

As has been previously stated, Lazarus developed the multimodal perspective from the area of working with adults in clinical settings. While Keat (1981) and other writers do demonstrate the use of the multimodal perspective - and variants of it - with children, there is no evidence of the approach being adopted by Educational Psychologists in Britain. The result of a "chaser" enquiry placed by the present author in the Bulletin of the British Psychological Society resulted in a response from one psychologist in Britain who was aware of Lazarus' work - and again this came from an overtly clinical adult orientation. It seems appropriate, therefore, to consider the whole area of applied educational psychology in some detail, and consider the possible contribution that a multimodal perspective may have to make in this instance.

4.2 PROFESSIONAL NEEDS OF THE EDUCATIONAL PSYCHOLOGIST

As was signalled by the publication in 1978 of "Reconstructing Educational Psychology", Gillham put a marker down for the changing role of the psychologist. The demands from both schools, parents and society in general through evolving Education Acts, required a more proactive problem solving role in which the professional training could be put to use in the form of advice for teachers and parents, specialist programmes for children with specific needs, and all against the backdrop of seeing the child in a social and systemic

context. At the same time the requirements for more specialist knowledge in narrower areas - e.g.: learning difficulties, physical handicap etc. - increased, and the balance to be struck between generic and specialist work became increasingly difficult to strike. Another related demand which filters through the system to the psychologist is that for increased accountability and cost effectiveness regarding practice and recommendations. The need to evaluate outcome in a manner that will enhance good practice becomes paramount.

With the background of such changing demands on professional practice, the psychologist requires better and more consistent training and access to work practices which will systematically act as a comprehensive descriptor of practice on the one hand, and a systematic evaluator of practice on the other. It will be useful to consider how the multimodal paradigm may go some way to meeting these changing professional needs of the Educational Psychologist.

4.3 ADVANTAGES OF THE MULTIMODAL APPROACH TO EDUCATIONAL PSYCHOLOGY IN PRACTICE

Bearing in mind Lazarus' contention that the seven modalities of the BASIC-ID cover all the possible aspects of individual human psychological functioning, it would seem reasonable to suggest that using such a schema would allow the psychologist to take a more comprehensively systematic view of any individual. There would appear to be two levels at which this could be considered - the micro level concerned with the comprehensiveness of individual assessment, and the macro level concerned with more general issues of the child in context and implications flowing from that.

4.3.1 MICRO ANALYSIS - THE BASIC-ID AND INDIVIDUAL ASSESSMENT

Each of the seven modalities can be considered in turn, and consideration given to the extent to which conventional psychological practice will cover them:

1. BEHAVIOUR MODALITY

   Clearly there can be no doubt that overt, observable behaviour forms a fundamental part of the practice of the majority of Educational Psychologists. Depending on the presenting problem, and on the psychologist's own theoretical orientations, interventions are very often centred in this modality.

2. AFFECTIVE MODALITY

   Educational Psychologists will very often concern themselves with a child's emotional functioning, although most frequently the concern will tend to focus on the behavioural manifestations of emotional difficulties. The richness of the analysis - especially that obtained by "tracking" across modalities - is something the conventional practice lacks, and it is clearly a dimension that the multimodal approach adds.

3. SENSORY MODALITY

   In general, little systematic account is taken of issues arising in this modality. It may be that what a child "feels" - in a bodily sense - is looked at peripherally - usually in relation to emotional factors - but this rarely becomes part of a systematic analysis of a child's psychological functioning.

   There may also be some semantic confusion here as well - sensory problems are more often than not taken to relate to areas of

sensory integration, usually visual or hearing. In the multimodal framework, such issues will tend to be subsumed under the 'B' modality.

4. IMAGERY MODALITY

Imagery, in the sense used by Lazarus (1976, 1981), tends not to be considered an important area in either assessment or subsequent intervention in Educational Psychology practice. It could be that when Imagery is used - e.g.: as part of hypnotic techniques - they are arrived at coincidentally and not in a systematic manner as might be the case in a detailed multimodal analysis.

5. COGNITION MODALITY

There would appear to be two aspects of this modality, one which forms the 'bread and butter' work of the Educational Psychologist, and the other which rarely, if ever, will be considered.

Firstly, the educational psychologist will give a thorough and comprehensive analysis of a child's cognitive functioning in terms of abilities and attainments in certain identified skills. Intelligence testing and attainment analysis will provide a depth in this area when appropriate.

Secondly, this modality also focuses on the nature of an individual's thought processes - especially irrational and self destructive - which may be adding to the individual's psychological distress.

6. INTERPERSONAL MODALITY

The child's social world is obviously of crucial interest to the psychologist seeking to gain a better understanding of how the child functions. This modality allows the child's functioning to be assessed more coherently and meaningfully in a manner which maintains a balance between individual factors and contexts. Lazarus (1981) cautions against a shift of attention away from a disturbed individual to a dysfunctional system and suggests that the multimodal analysis allows the practitioner to swing the focus of attention from the individual to the social setting, and thus achieve more rapid, elegant and longer lasting therapeutic gains.

7. BIOLOGICAL MODALITY

The Educational Psychologist will often have to bear in mind biological factors when assessing a child although this often tends to relate to relatively 'static' background problems, against which other factors are considered - e.g.: physical handicap, chronic disease. It is unlikely, however, that the psychologist will consider this modality in the broadest sense that Lazarus is suggesting - e.g.: hygiene, diet, physical fitness, etc.

Thus, these more routine aspects of a child's physical functioning may well be missed out in a conventional assessment, whereas the multimodal assessment will act as a marker for considering them.

As can be seen from this more micro analysis of the modalities of the BASIC-ID in terms of conventional Educational Psychological practice,

there are areas of considerable overlap and commonalities, but also there are areas where the multimodal approach offers a more comprehensive and thorough analysis of an individual's psychological functioning. It is always easy to focus on the overlaps and to ignore the differences, but as Lazarus (1981) points out, ignoring such differences may well be to overlook significant factors that may account for a critical variance.

Thus, it could be argued, at the micro level of the individual's psychological functioning, the multimodal perspective may well have a considerable role to play in making the psychologist's assessment as comprehensive as possible.

4.3.2 MACRO ANALYSIS - THE BASIC-IB IN A SYSTEMIC CONTEXT

As was pointed out earlier, the needs of the Educational Psychologist are such that consideration has to be given to how a child's difficulties - whatever they may be - are to be seen in the context of the social situation that the child is in. This is not to say that consideration is only given to systemic variables, but that a thorough understanding of how any system impinges on a child can only come from an initial thorough analysis of the individual processes of the child. Many of the more conventional assessment strategies adopted in Educational Psychology tend to be based on the reductionist / analytical paradigm that focuses assessment in a convergent manner, thus making it hard for the psychologist to retain meaningful links with the systemic context in which the child is functioning e.g.: an I.Q. score of 96 does not help much in planning for intervention in a school setting.

On the other hand, the comprehensive nature of the multimodal assessment has the ability to break the restrictions of the reductionist model, and therefore gives the psychologist information which may be of more use in considering how the child's difficulties can be viewed in context. The previously cited work by O'Keefe and Castaldo (1980), Brunell & Young (1982) and Roberts, Jackson and Phelps (1980), all give examples of how the multimodal perspective enabled the contextual situation to be considered in a meaningful and constructive fashion. Thus, the practice is there to suggest that the individualised multimodal assessment, when considered in conjunction with a multimodal view of the organisation and context, can provide a powerful model for facilitating and encouraging constructive change.

It may well be thatthe multimodal paradigm can be very useful to the psychologist who wishes to ask - what are the needs of this individual child in this situation, and what are the implications for the child and the system of seeking to meet these needs?

Thus, when considered from both the Micro and the Macro level, the multimodal perspective would potentially seem to offer a valid framework which the Educational Psychologist may find useful in trying to meet professional needs of a changing and developing role.

4.4 DISADVANTAGES OF THE MULTIMODAL APPROACH TO EDUCATIONAL PSYCHOLOGY IN PRACTICE

It would be only reasonable to consider whether or not there are any obvious problems arising for an Educational Psychologist wishing to adopt a multimodal perspective to professional practice. Again, this

may be considered from both a Micro and a Macro level.

At the micro level there would be no particular difficulties for a psychologist wishing to adopt the multimodal approach to individualised assessment and intervention planning, providing they were prepared to accept the principles of pragmatic technical eclecticism so central to Lazarus's position.

At a more Macro level, the superficially gimicky nature of the BASIC-ID acronym will not readily lend itself to facilitating communication with other professional colleagues or institutions which may take a more conservative approach to such issues. This may well prove a problem in inter-disciplinary settings where the need to justify the use of the BASIC-ID schema may act as a deterrent for all but the most committed of multimodal practitioners.

Also, because of the pluralistic and individualistic nature of the multimodal approach - as was pointed out before - the consequent difficulties of demonstrating generalisable effectiveness may prove a drawback - especially in terms of demonstrating utility of the approach to professional colleagues. This is a problem which is by no means unique in Educational Psychology, but it is perhaps the insistence on the comprehensive and interactive modality analysis which makes this seem even more of an issue with multimodalism. In other instances, the factors made explicit in a multimodal analysis, while still being present will tend not to be identified, and may well be conveniently swept under the carpet or generally dumped into the catch-all of uncontrolled variables. It might also be said that a problem for the Educational Psychologist using the multimodal approach, is that it emphasises a 'deficit' model - i.e.: highlights problem areas and areas of difficulty only. This has to be seen against the

backdrop of a growing insistence in applied psychology on trying to move away from such an overtly 'deficit' model, to one which adopts a more balanced view of an individual's strengths and weaknesses. Although it is true to say that the vast bulk of the case studies reported in the literature on multimodalism adopt such a 'deficit' model, it has to be said that this is a more fundamental attitudinal issue among practitioners, and not an artifact of the BASIC-ID schema per se. Indeed, it would be quite easy to imagine a BASIC-ID profile of an individual which highlighted particular areas of strength as well as problem areas - such areas of strengths may well be utilizable in any intervention strategy subsequently planned.

However, all in all it can be said that the disadvantages to the committed multimodal practitioner in an Educational Psychology context would be no greater than the difficulties associated with following any other particular line, and certainly should not act as a significant deterrent to the adoption of a multimodal approach, especially in view of the potential advantages.

4.5 CONCLUSION

This section has sought to put the current practice of Educational Psychology in a context which considers the needs of the psychologist in carrying out a role which is changing and evolving. As has been demonstrated, these evolving needs are placing increasing demands on the psychologist, and the multimodal perspective may well have a role to play in helping meet these needs, in that it can potentially take a comprehensive and systematic assessment through to a planned and evaluated intervention which addresses both individual and systemic issues. The need for greater accountability in professional practice

demands the adoption of approaches which lead clearly and logically from assessment through intervention to evaluation, and the multimodal perspective would seem to potentially offer this facility.

5. THE MULTIMODAL PERSPECTIVE AND THE PRESENT RESEARCH ISSUE

5.1 INTRODUCTION

One of the most common, and at the same time an often very emotive issue, referred to the Educational Psychologist is the child who, for a variety of reasons, is having great difficulty with the basic skills of literacy. Literacy in general, and reading in particular, are so central to functioning in our society, that the psychological ramifications of failure in this area are often legion. While there is a tacit acceptance of the uniqueness of each individual referred for such difficulties, conventional practice tends to adopt a generalising and reductionist model which often ends in the child being labelled 'dyslexic' etc., and with quite non-specific remediation strategies being implemented.

Thus, in considering this population of children with learning difficulties, it seemed appropriate to consider the potential contribution of a more holistic strategy such as multimodalism, in order to try and address this anomaly of accepting the uniqueness of the individual while applying broadly standard assessment and intervention procedures.

5.2 THE MULTIMODAL APPROACH IN THIS CONTEXT

As was pointed out above, the main need in this study was to use a specific and individualised approach to the assessment and intervention with children referred with learning difficulties, and to compare this in some evaluative sense with the more traditional generalised approaches. The multimodal approach suggested itself as worthy of investigation in this context for four apparent reasons:

5.2.1 EDUCATIONAL MODEL

Despite the genesis of multimodalism lying in adult clinical psychology - a point made on several previous occasions - the approach, certainly in terms of intervention, lies more clearly in a Learning / Educational framework, rather than a Clinical one. This was seen as especially important in this instance because:

(i) The clients were children being dealt with in overtly educational settings - i.e.: school.

(ii) Although more clinical strategies are not excluded, the majority of intervention strategies adopted with such children are learning based.

(iii) Communication with other professionals - such as teachers - tends to be facilitated when the psychologist talks in educational, rather than clinical terms.

5.2.2 INDIVIDUALISTIC AND COMPREHENSIVE MODEL

As has been clearly pointed out previously, the multimodal approach allows for an assessment of the individual which is at one and the same time comprehensive across the seven modalities of the BASIC-ID, and specifically individualistic in that each subject will have a quite unique profile across the BASIC-ID.

Thus, it would seem that this meets one of the major criteria that each child should be considered in terms of their own unique profiles of strengths and weaknesses. Also, allowing for prioritizing within the modalities, the multimodal approach still insists on the coverage of relevant issues across all seven modalities, hence the on-going

monitoring of process allows for the continued comprehensive picture to be considered at all times.

5.2.3 SYSTEMATIC MODEL

Lazarus (1981) suggests a major strength of the multimodal approach is its framework of systematisation. Experience dictates that conventional approaches to dealing with children with learning difficulties ranges from the highly systematic to the vague and ad hoc. Thus, a potential benefit of the multimodal approach may well lie in the fact that it offers the practitioner an on-going systematic bench mark against which to monitor progress.

5.2.4 TECHNICAL ECLECTIC MODEL

The other great cornerstone of Lazarus' position, as has been demonstrated, is the insistence that interventions be guided by the consideration of pragmatic technical eclecticism. Thus, while offering a quite different overall framework from which to work, at no time is any intervention strategy rejected for reasons of theoretical inconsistency. Thus, the practitioner adopting the multimodal approach has access to any intervention that is judged appropriate by the BASIC-IB analysis of the difficulties. Hence, existing good practices - of which there are undoubtedly plenty - can be subsumed under the multimodal framework and used, providing they demonstrably address a particular area highlighted in the BASIC-IB analysis. No need, or danger, indeed, of throwing the baby out with the bathwater.

5.2.5 THE MULTIMODAL APPROACH - COMMUNICATING WITH THE PROFESSIONALS

If the Multimodal Approach is to be of use in the Educational Psychology context, then clearly the principles and practices would have to be clearly communicated and understood. It may be possible to envisage a flow diagram, such as the following, as providing a useful framework which would enable the psychologist to outline the sequential link between assessment using the Basic IB, and subsequent interventations across the modalities.

To further clarify the position, the flow diagram may be used in conjunction with a hypothetical case study which would illustrate the process more vividly.

MULTIMODAL PROFILE

The Multimodal Report considers the child's psychological functioning across the seven major modalities. The layout of the report follows in a logical and sequential fashion as follows:

PROBLEM DEFINED → PATTERN OF PROBLEM → CONSEQUENCES

(detailed description of main problem areas across seven modalities).

(How and in what situations the problems occur).

(What is the consequence for child and others of the problem outlined).

INTERVENTION STRATEGIES → INTERVENTION RECOMMENDATIONS

(across the seven modalities are there interventions that are psychologically appropriate).

(A generalised recommendation which takes into account all aspects of the child's functioning.)

The flow diagram takes the reader from the definition of the problem across the 7 modalities of the BASIC - IB, to an analysis of the characteristic patterns in which the problem manifests, to a consideration of the consequences of the problem for the child, to an outline of intervention strategies, and finally to a set of intervention recommendations which will cover all the aspects of the BASIC - IB , and which will also delineate a timescale for review.

CHAPTER TWO.

CHAPTER TWO .

LEARNING DIFFICULTIES : A MULTIMODAL PERSPECTIVE ON THE LITERATURE.

1. INTRODUCTION

1.1 OVERVIEW

The interest held by psychologists, educators and other interested professionals in the problems experienced by children who have difficulties in acquiring the basic literacy and numeracy skills so vital for all facets of functioning in our society, has over the years spawned a research literature of vast and multi-faceted proportions. The field is made unfortunately more complex by the additional twist of different researchers with theoretical and philosophical commitments that are often apparently mutually exclusive, tackling the same manifestations of the problem from quite different points of reference.

The most obvious manifestation of this problem comes in the seemingly endless debate between the medically orientated "dyslexia as a specifically diagnostic category" camp, and those that believe that there is no such thing as dyslexia per se, and who tend to think of the problem in terms of specific disabilities or difficulties. The majority of educational psychologists would probably line up in this latter camp, and indeed, Waddon (1982), presents some empirical evidence to support the claim that psychologists are not happy with the term 'dyslexia' because it suggests a medical label. Many of the counter-arguments are held equally strongly, and Critchley (1981) is a good example of this medically-orientated syndrome position. He is highly critical of the point of view, typified in the Bullock Report (DES, 1975) that:

(a) Dyslexia is incapable of precise operational definition.

(b) A more helpful term is "specific reading retardation".

Critchley (1981) dismisses these views as "totally unwarranted", and he goes on to insist that dyslexia is a complex syndrome the responsibility for the diagnosis of which is an undeniably medical one. He is in no doubt that the physician's role is to isolate and identify the causal factors behind the dyslexia, as opposed to the reactive factors which are seen as being of secondary importance. Critchley is quite aware that this position is less popular with educational psychologists, but as he puts it, "the truth can scarcely be denied".

In general, the medical model sits uneasily with psychologists even in an overtly clinical setting (e.g. considering neurotic disorders or even psychotic disturbance); however, they tend to become very unhappy when it is seen to encroach upon a clearly educational area such as is the case with dyslexia or learning difficulties. The Tizard Report (DES, 1972) discounted the evidence for a specific syndrome of developmental dyslexia, and instead preferred the term "specific reading difficulty". The Bullock Report (1975) preferred the term "specific reading retardation", while a comprehensive literature review by Tansley and Pankhurst (1981) broadened the concept out to talk about children with "specific learning difficulties", thus recognising the fact that problems with spelling, writing, number and speech could also be important.

Although there will undoubtedly be differences in emphasis, it would be true to say that most educational psychologists would tend

now to align themselves behind the philosophy and ideals as expressed in the Warnock Report (DES, 1978) which has subsequently become enshrined to some extent in the 1981 Education Act and the 1981 Education (Scotland) Act. Broadly speaking, the emphasis to emerge here is an attempt to identify and cater for the individual's needs - educational, social and emotional, all of which are seen as relevant aspects of the child presenting with a difficulty. Although the Warnock recommendations, which cover the whole range of special educational needs, do not preclude the more overtly medical practice of labelling children's disabilities, in reality the result has been a tendency to focus at a more pragmatic level on the child's specific needs, and how these needs can best be met. This is no less true for the child with a learning problem than it is for a child with a highly complex physical and/or mentally handicapping condition.

Regardless of which camp one wishes to be identified with, it seems clear that the arguments, claims and counter-claims, tend to breed confusion worse confounded. Stauffer, Abrams and Pikulski (1978) refer to a review by Adams (1969) in which he found thirty two differing definitions surrounding the term "dyslexia" coming from psychologists, educators, neurologists and psychiatrists. As Adams suggests, the quest for the holy grail of dyslexia has divided the efforts of professionals when collaboration would have been the better course. Cruikshank (1968) gives a beautiful pot-pourri of what happens to the definition of a child's difficulty as the location varies across the United States.

"If the child diagnosed as dyslexic in Philadelphia moves to Bucks County, ten miles north, he would be called a child with language disorder. In Montgomery County, Maryland, a few miles south, he would be called a child with special or specific language problems. In Michigan, he would be called a child with perceptual disturbance. In California he would be called either a child with educational handicaps or a neurologically handicapped child. In Florida and New York State, he would be called a brain injured child. In Colorado, the child would be classified as having minimal brain dysfunction." Cruikshank (1968).

Perhaps as Meredith says (DECP, 1983)
"Dyslexia is the unidentified flying object of educational psychology". It is important to note that it is the intention of this review to take a generally pragmatic view in line with that described by Lazarus (1981) when discussing the multimodal paradigm. Lazarus tends to be less sympathetic with positions in all areas of psychology that claim the ability to make direct causal inferences, and although it will be important to consider such positions in the review, no attempt will be made to enter into a debate between various positions regarding the causative factors in learning disabilities. The intention will be to map out a broad overview of the whole area in a manner that can be related to the overall flow of the research project.

1.2 STRUCTURE OF THE REVIEW

As has already been pointed out, the amount and diversity of the literature on this topic is so large and extensive as to pose serious problems of management.

With this point in mind, it seems pertinent to state that the review should keep in mind the following:

1. The need for a review which will give a broad overview of the field, while avoiding the trap of becoming too detailed.
2. The need to draw the review together in a manner that will be seen as relevant and useful from the point of view of practising educational psychologists.
3. The need to make some reference throughout the structure of the review to the nature of the specific research being reported in this thesis.

In order to try and deal with these points, the review will take the following form:

1. A review of the research which will start from the more general perspective on the individual, proceed through looking at more detailed cognitive processes that are considered to be involved, and then consider issues around the individual which appear to correlate with learning difficulties.
2. An attempt will be made to examine the extent to which the seven modalities as described by Lazarus (1981), in the BASIC-ĪB can be found throughout the whole spectrum of learning difficulties, in order to give the review a context against the general background of the research study.

3. Consideration will also be given to the literature on attempts to remediate learning difficulties, in order to put intervention strategies in the same context.

It is hoped that in this manner, the review will be both coherent, comprehensive and relevant to general research issues being considered.

Note:

When reference is made to the seven modalities of the Multimodal Paradigm in the text, the following abreviations will be used to identify the modalities:

'Be' - Behaviour Modality

'A' - Affective Modality

'S' - Sensory Modality

'I' - Imagery Modality

'C' - Cognitive Modality

'Ip' - Interpersonal Modality

'B' - Biological Modality

2. GENETIC ASPECTS OF LEARNING DIFFICULTIES

2.1 INTRODUCTION

The extent to which an individual may have a genetic propensity towards learning difficulties seems a natural starting point in the study of the subject. The classic nature-nurture debate is one which arises in many areas of psychology, and consequently one would expect genetic determinacy to feature quite strongly in the literature on learning difficulties. Critchley (1970) is typical of a line of thought which sees genetic factors as important in the area of reading problems. He argues strongly for what he describes as "developmental dyslexia", which, in his view, is specifically constitutional and genetic in origin.

In general terms, when looking for evidence of genetic factors in learning difficulties, there are several areas of research that can be considered:

2.2 Family History Studies

2.3 Twin Studies

2.4 Longitudinal Follow-up Studies

2.5 Biochemical Studies

2.6 Gender Studies

We can consider each in turn.

2.2 FAMILY HISTORY STUDIES

Studies in this area date back to the beginning of the century, and a paper by Plate (1909), in which he traced poor readers through three generations within families, is typical. Supportive results were also found by Ronne (1936), Marshall and Fergusson (1939)

Norrie (1939) and Kagen (1943). In a slightly more recent, post war study, Hallgren (1950) found that in 88% of subjects identified as having learning difficulties, similar problems were reported in relatives.

Owen (1978) reviews much of this earlier work, and suggests that although the evidence shows a high degree of probability that dyslexia has a genetically determined component, it still does not lead to the identification a clearly distinct group of dyslexic children - in the way that Downs Syndrome children are clearly identifiable, for example. Owen concludes that multifactorial genetic disposition may be considered the source of one type of learning difficulty, but he will go no further than that. McLearn(1978), also emphasises the importance of adopting a multifactorial approach to the problem, which not only includes genetic factors, but will also incorporate environmental variables as well.

There are more recent and well-documented studies in this area which can be looked at. Naidoo (1972) found that consistent family history patterns were more frequent with spelling difficulties in comparison to reading difficulties. Yule and Rutter (1976) also found a high incidence of family history of reading difficulties with both subjects who were significantly slow in developing reading competence, as well as with subjects who appeared as having more specific reading difficulties. Silver (1971) found up to 30% of subjects studied had consistent family histories of similar difficulties, although Silver also emphasised the

importance of environmental factors. Doehring (1968) found upwards of 40% of subjects with reading difficulties had parents who had similar problems, compared with approximately 10% of matched controls.

It does, however, have to be pointed out that this general trend in studies showing a genetic determinacy in learning difficulties is not supported in all studies. De Hirsch et al (1966), for example, found no significant correlation between reading achievement and any familial related characteristic.

It has, of course, to be pointed out, that a higher incidence of learning difficulties and related characteristics within families does not necessarily imply genetic causation. The very important influence of environmental factors has to be taken into account, and the distinction between genetic and environmental variables is not an easy one. Yule and Rutter (1976), for example, emphasised the importance of social context in considering reading problems pointing to the higher incidence of reading retardation in large families as one example. Davie, Butler and Goldstein (1972) demonstrated that reading attainment among children varies in direct proportion to the interest shown by their parents. Singleton (1976) and Bale (1974) also support this point of view, emphasising that in families where poor attitudes to education are engendered as part of the sub cultural norms, then this may be a powerful determining factor when considering the child's general attainment pattern.

2.3 TWIN STUDIES

Despite the obvious difficulties of following up twins - both mono and dizygotic - studies of this nature have proven a popular route to testing a genetic hypothesis within psychology.

Hermann(1959) provides some evidence in this area. With 12 pairs of monozygotic twins, he found evidence of a very similar pattern of difficulties. With a sample of dizygotic twins, the concordance rate between twins was approximately 33%. Herman took this as strong evidence of a genetic link as a major determining factor in such learning difficulties.

It can, of course, be argued that Herman's studies represented a relatively small sub-set of the population of children with learning difficulties, and that twins are much more likely to have a higher incidence of pre-natal or early neo-natal complications due to the medical difficulties that may be associated with such births. Singleton (1976) also cautions against reading too much into the apparent evidence of such twin studies, as in the majority of cases environmental influences are not controlled for.

2.4 LONGITUDINAL LIFE HISTORY STUDIES

Goldberg and Schiffman (1972) hypothesise that if a learning difficulty is genetically determined, then there will be an increased likelihood that it will persist throughout the subject's life span, and be less amenable to remedial intervention, than would be the case if it were not genetically determined. Several

researchers quote studies which would support this hypothesis; for example, Rawson (1968), Silver and Hagin (1964, 1966), Yule (1973) and Yule et al (1974). Evidence of this nature would tend to be incompatible with evidence supporting a maturational lag hypothesis. In the former, the evidence tends to show a persistence of the learning problem throughout life, whereas the maturational hypothesis would tend to suggest that the learning difficulty may be a function of maturational factors, and as such would be expected to remedy itself over time. The maturational lag hypothesis will be considered later in the review.

2.5 BIOCHEMICAL STUDIES

Another hypothesis which is related to potential genetic factors, is that which considers that biological characteristics and potential chromosomal abnormalities may give insight into genetic determinants of learning difficulties.

Park, Bieber and Zeller (1975), found that degradation rates of monoamine oxidase - a metabolic regulation enzyme - were consistently elevated in dyslexic subjects compared with matched controls. However, as researchers point out, it is unclear as to whether this is in itself a causational factor, or whether it may indeed be related to an effect of the disability in the first instance.

A study by Park and Schneider (1975) found that dyslexics had a significantly elevated thyroxin level compared with controls, and Hughes (1976) took the issue further by hypothesising that

dyslexics with such elevated thyroxin levels may have what was described as "hypermetabolisms". Despite these findings, however, it is still unclear how such abnormalities in metabolic functioning may be related to the learning problem.

In a related biochemical field, some studies have looked at chromosomal abnormalities in learning disabled subjects. Childs (1964) reports that there were no chromosomal abnormalities present in a sample of reading disabled subjects, whereas a study by Grenn and Perlman (1971) did find evidence of chromosomal abnormalities in a population of learning disabled subjects.

2.6 GENDER STUDIES

It has been hypothesised that the higher incidence of learning difficulties in male subjects compared to female subjects, may be indicative of a genetic background to the problem. Estimates of the variation of ratios of male to female in the population of learning disabled children vary from 5 males to 1 female (Naidoo 1972), to 4 males to 1 female (Critchley 1970), to 3.3 males to 1 female (Rutter et al 1970). There are various reasons posited for this bias towards males in the learning disabled population. Goodacre (1968) shows that studies in which males and females are compared tend to focus on mean test scores - where there is this significant discrepancy between males and females. However, when the range of scores is compared, it is found that male subjects have a much larger range than female subjects, indicating that, whereas many more males score poorly, there is also a significantly higher number of male subjects who score much better than females.

As a result, when a focus is made on the lower range of scores - normally associated with learning difficulties - there will tend to be a preponderance of male subjects. Goodacre argues that this may simply be an artifact of the distribution of abilities across the sexes, as opposed to a phenomenon related to learning difficulties per se. Kagen (1964) takes a view which tends to owe its allegiance to Goffman's role theory. He suggests that the behaviour of reading is less consonant with the male role than with the female role, and consequently it would be expected that male subjects will be more likely to have problems with the task compared with female subjects.

Goldberg and Schiffman (1972), take an overview of this area, and present various explanations for the findings:

1. There may be a maturational factor involved inasmuch as females generally tend to mature faster than males during childhood.

2. There may be a motivational component inasmuch as females tend to be more motivated than males in the learning situation.

3. The sex bias in learning difficulties may be related to the fact that males tend to have a higher incidence of cerebral trauma and other types of brain damage, although there appears to be no firm suggestion as to why this should be the case.

4. Goldberg and Schiffman also argue that the general emotional trauma and conflict for boys is greater than that for girls,

due to any combination of the above reasons, and are such they may well be more likely to experience learning difficulties.

Other researchers have considered various environmental hypotheses as to why there is this sex imbalance. Moseley (1972), found that male subjects tended to be more concerned with peer group approval within the class situation, than were females, and that consequently males were less motivated to seek teacher approval by applying themselves to the learning task at hand. McNeill (1964), suggests that the problem may be more directly associated with the fact that female teachers predominate in the early education years, since female teachers may be more likely to use methods suitable for girls than boys. Kellmer-Pringle et al (1966), focus on the content of reading schemes. The suggestion is that male subjects are less interested in reading than females because such reading schemes tend to be more directly home orientated, and as such may be more appealing to girls than boys. This position may well have been valid with some earlier reading schemes, but the greater variety and diversity of reading material available now would tend to undermine such an argument.

2.7 GENETIC FACTORS - A SUMMARY

The spectrum of evidence considered in this area tends to be somewhat equivocal. Twin studies, and Family History studies would appear to offer some evidence to support a genetic view of learning difficulties, but as so many other variables are operating in these situations, it is hard to reach any definitive cause and effect

judgements regarding genetic factors. The psychologist assessing for learning problems would always want to take a case history which would highlight any potential genetic component, but at the end of the day it will not lead the psychologist towards a more specific intervention strategy.

2.8 GENETIC FACTORS - A MULTIMODAL VIEW OF THE LITERATURE

Any suggestion of a genetic component with learning difficulties will tend to relate to the 'B' modality of Lazarus' BASIC-ID profile, as there is the clear suggestion of factors in the individual's biological substrata. Some of the other evidence considered - especially as it relates to the Gender factors - would suggest an involvement in other modalities - most particularly 'Ip' (Moseley, 1972); (McNeill, 1964); 'A' modality (Goldberg and Schiffman, 1972); 'C' modality (Moseley, 1972); (Kellmer-Pringle et al, 1966); and 'I' modality (Moseley, 1972).

Thus, even in a relatively narrow area such as genetic factors, the literature does refer to features which begin to appear across the BASIC-ID.

3. GROSS PHYSICAL IMPAIRMENT AND LEARNING DIFFICULTIES

3.1 INTRODUCTION

When considering biologically related aspects of learning difficulties, it would seem appropriate to consider gross physical impairments that may have a significant relationship to learning difficulties, before moving on to look at more specific biological features. It is important to clarify in this respect, that we are not considering gross physical impairments which will tend to result in learning difficulties because of their overwhelming nature - such as severe physical handicap - but such gross physical impairments which might not obviously be related to learning difficulties - such as gross motor skills and coordination problems.

3.2 GROSS MOTOR DIFFICULTIES

Much of the work in this area has concentrated on the potential relationship between gross motor skills, coordination skills and learning difficulties. Brenner et al (1967) reported that clumsy movement and awkward physical gait were characteristic of a sample of children who were of average ability, but who nevertheless had problems with spelling, number work and writing. Rabinovitch (1968) found that subjects with reading difficulties tended to be awkward and clumsy in gross motor movement.

Lucas et al (1965) found that poor coordination was often associated with reading difficulties. Similar results were reported by Naidoo (1972), Lovell and Gorton (1968), and Salmon (1978). In the Isle of Wight Study, Rutter et al (1970) found that subjects with specific

reading problems were much poorer than matched controls in motor coordination and general physical ability, and in many instances they had a history of delayed motor development. Newton et al (1979) point out that mature gross motor functioning requires the appropriate development of lateralization of the gross motor skills - left-sided movement controlled by the right hemisphere and vice versa. In subjects with learning difficulties, the maturation of such motor functions may be somewhat inconsistent. Not only does this lead to the gross motor difficulties - so overtly obvious - but, it is argued, the inconsistent lateralization of brain function may also be related to the manifestation of learning difficulties, but at a much subtler level.

There are, however, some studies which tend not to support this connection between gross motor impairment and learning problems. Trussell (1969) suggests that gross motor skills are a specific developmental feature, and that they are in no way related to reading, which Trussell sees as a cognitive function. Allen (1971) also reported no correlation between gross motor abilities and other cognitive abilities.

3.3 BODY CONCEPT

At a more general level, Tansley (1967), and Rozenberger (1970), associated the holding of a poor body concept by the individual with difficulties in reading. This is, of course, a difficult concept to deal with, and often it tends to be seen as an inferred construct by the researcher or the professional working with the child. Such correlations as have been reported are of moderate proportions.

3.4 EURYTHMICY

Eurythmics is coordinated rhythm and movement based on the philisophy of Rudolf Steiner. This is neither the time nor place to focus on eurythmics in any detail, but a study by Hunt and MacCauslan (1979) found that children with reading difficulties performed less efficiently than those without a reading problem, an aspect of Eurythmicy - most notably with rhythm, general coordination, personal direction, and an understanding of three dimensional form in space.

3.5 GROSS PHYSICAL IMPAIRMENT - A SUMMARY

At best, it could be said that certain gross physical impairments - most notably gross motor skills and coordination - may be associated with reading difficulties in some instances, but not all.

3.6 GROSS PHYSICAL IMPAIRMENT - A MULTIMODAL VIEW OF THE LITERATURE

Clearly, the vast majority of the literature in this area focuses on relevant biological features of the individual, and consequently would be related to Lazarus' 'B' modality. To some extent, issues of body coordination involve elements of sensory function - in some ways related to the 'S' modality, and the whole area of body image brings in features of both 'I' modality and 'C' modality - inasmuch as body image involves thinking about and holding mental images of oneself.

Again, the areas referred to in the literature do seem to spread across BASIC-IB to a certain extent.

4. BRAIN DAMAGE AND LEARNING DIFFICULTIES

4.1 INTRODUCTION

Having considered the influence of general gross physical impairment in the area of learning difficulties, it would seem appropriate to focus on areas where specific damage is seen as being related to learning difficulties. The most obviously researched area here is brain function. Later in the review consideration will be given to the role more general brain processes play in learning difficulties, whereas in this instance attention will be given to the research that seeks to identify specific brain lesions and damage, and to relate them to learning difficulties.

Many of the more medically orientated approaches to learning difficulties tend to take this line, and some writers - such as Dinnage (1970) and Newton and Thomson (1975) - will restrict their definition of learning difficulties to factors which are identifiably neurological in origin. Kirk (1968) takes a slightly broader view, seeing learning difficulties as a cerebral dysfunction, with related emotional and behavioural difficulties.

Abrams(1968) posits three types of severe reading difficulty arising from neurological dysfunction:

1. Difficulties whose origins lie in a defect of the central nervous system.
2. A specific reading difficulty arising from brain injury - caused by a lesion to the occipital-parietal lobe.
3. A reading difficulty related to a generally disturbed neurological organisation.

Studies such as these by Drew (1956), Casey and Ettlinger (1960) and Kinsbourne and Warrington (1962), provide some support for the second of Abram's categories, in that they identify certain adult dyslexics with partial occipital brain damage.

Kawi and Pasamanick (1959), suggest a link between brain damage sustained in ante-natal or neo-natal situations, and a subsequent tendency towards reading difficulties. Newton and Thomson (1975) also share this view, and suggest a connection between reading difficulties and children who have been at risk at some point during birth.

On the other hand, Naidoo (1972), demonstrated that there was no greater frequency of birth hazards in dyslexic subjects, compared with other subjects. In effect, Naidoo is suggesting that ante-natal and neo-natal complications may be linked with reading difficulties in some instances, but not in others.

4.2 SOFT NEUROLOGICAL SIGNS

As the evidence of brain damage can be extremely difficult to pin down in a direct form, often requiring highly sophisticated techniques, considerable interest has been focussed on what have been described as soft neurological signs, which are more readily observable, and which may in themselves be directly related to some more fundamental cerebral dysfunction. Examples of such soft neurological signs could be factors such as exaggerated tendon reflexes, mild ataxia, clumsiness and extensor plantor responses.

Again, despite the more obvious nature of these features, assessment can be difficult, and often inferred from case histories and minimal observation, rather than being directly measured. Goldberg and Schiffman (1972) emphasise this difficulty, and they further point out that many such signs of possible brain dysfunction do not reveal themselves in any obvious manner. They cite as examples, features like moderate retardation in reaching physical milestones, physical awkwardness, emotional instability, hyperactivity, slow speech and language development. Criteria in many of these instances often tend to be vague and singularly subjective, and as such can clearly lead to problems of differential diagnosis depending on source.

Critchley (1970) cautions against relying on such subjective measures of these apparent soft neurological signs. He argues that the identification of brain dysfunction in the case of learning difficulties requires searching, and generally more sophisticated, techniques. Critchley ultimately argues that such a competent diagnosis requires expert medical examination.

Farnham-Diggory (1978) is much more sceptical of the ability to diagnose neurological dysfunction, pointing out that standard neurological examinations are relatively insensitive to all except the most severe forms of brain damage, and as such may well be of little use in diagnosing learning difficulties.

Not surprisingly, considering the antagonism that the medical model tends to engender within applied psychology, there are plenty of critics of the brain damage / cerebral lesion model of learning difficulties. Crabtree (1976) is typical of the criticisms made in this area. As he points out, there is clearly evidence that is

quite inconsistent with a model of brain damage as being a major causative feature in learning difficulties. For example, some brain damaged children learn to read quite successfully without any great difficulties, and with none of the characteristic features of a learning disabled child. Also, in other cultures such as Japan, all children learn to read at a very early age, and yet history of brain damage in the population as a whole is similar to that found in Great Britain.

As often tends to be the case, there is a significant trend to view neurological dysfunction as one of many influences relating to learning difficulties. Fry, Johnson and Muehl (1970) suggest that some form of minimal brain damage may occur quite coincidentally in learning disabled children, and there may well be no direct causative link. Ingram (1970) suggests that specific reading difficulties tend to be present when no brain damage is found, because, he argues, in a situation where brain damage is present, the child's difficulties would tend to be of a more general nature involving motor skills, perceptual problems and emotional difficulties, in addition to the manifestation of the learning problem itself. Keeney and Keeney (1968) are more specific. They coin the term "acquired dyslexia" to describe one form of the problem which is the only one directly resulting from brain lesion. Finally, Yule and Rutter (1976) in a large scale study, point out that there is more evidence of neurological disorders among children who may be considered as generally retarded, than is the case with children who would be considered as having a mere reading problem, or a more general learning difficulty.

4.3 ELECTROENCEPHALOGRAPHIC STUDIES

As was pointed out earlier, one of the major difficulties in assessing possible brain damage, is the problem of acquiring objective data. E.E.G. studies, in which objective measures of brain wave functioning can be taken, have been used as one possible route in overcoming this difficulty. Goldberg et al (1960) demonstrated that dyslexic subjects had a higher incidence of E.E.G. abnormalities than would normally be expected. Bale (1974) also presents evidence linking abnormal E.E.G. traces and reading problems. Sklar and Simmons (1972) used E.E.G. tracings to successfully discriminate between dyslexic subjects and matched control subjects, suggesting that brain dysfunction - as measured by E.E.G. - may well be an objective method of diagnosing learning difficulties. Some researchers have attempted to look at the specific characteristics of individual E.E.G. patterns, to try and draw more specific connections with learning difficulties. Hughes (1976), for example, found a peculiar pattern of positive wave spike responses in the E.E.G.'s of dyslexic subjects, although Hughes cautions against being too ready to make a direct association between the abnormal E.E.G. pattern and the learning difficulty. He argues that the E.E.G. response may well be related to other factors, such as behavioural characteristics of the subject, or more general emotional responses of the subject reacting to stress. On the other hand, Connors (1978) is somewhat critical of Hughes' findings, arguing that the data may be interpreted as showing that dyslexic subjects would not have abnormal E.E.G. patterns. Critchley (1970) further complicates the issue, by suggesting that abnormal E.E.G. patterns in poor readers may be precipitated by

the effort of trying to read in the first place, and as such, the E.E.G. abnormality may well be an effect of the reading difficulty, not a cause of it. Some other studies also show evidence of little or no E.E.G. abnormality associated with learning difficulties. Ohlson (1978), for example, reports a range of correlations from the very high, to little or no correlation at all. Spreen (1976) admits that the confused results of E.E.G. studies allow the psychologist little room for manoeuvre in terms of speculation about cause and effect. He even goes as far as to suggest that abnormal E.E.G. patterns may be a predictor of successful remediation, in as much as they may be a response from the brain to the adoption of a more appropriate coping strategy.

Farnham-Diggory (1978), in reviewing the literature in this field, quotes studies undertaken by Owen et al (1971). In measuring the E.E.G. activities of both learning disabled children, and normal matched controls, evidence was found for abnormal E.E.G. patterns in some of the learning disabled sample, and concurrent evidence of abnormal E.E.G. activity in some of the control samples. Farnham-Diggory argues that it may well be that more sophisticated technological advances in the measurement of E.E.G. functioning may produce more definitive results in relation to learning difficulties, but the somewhat confused and contradictory track record of studies to date suggests that such an ideal situation is, at best, still a considerable way off.

4.4 SPECIFIC BRAIN DAMAGE - SUMMARY

As can be seen, the literature in this field is somewhat contradictory. The position taken by Newton, Thomson and Richards (1979) is perhaps representative of the debate. They argue that brain damage or minimal neurological dysfunction, is merely one out of a possible eight salient features of learning difficulties as a whole, and as such represents merely a subset of the whole problem.

Some writers such as Hart (1976) and Singleton (1976) believe that if brain damage does occur, then a compensation mechanism would operate in which a different part of the brain would take over the function of the damaged part. Thus, brain damage may be viewed as less of a definitively static feature, and more as a dynamic process which may well be circumvented by the individual's own physiological characteristics.

Goldbert and Schiffman (1972), are also highly critical of the plethora of technological terms - e.g.: minimal brain dysfunction; minimal cerebral dysfunction - which, because of the vagueness and subjectivity associated with them, tend to breed confusion. Spreen (1976) is especially critical of the use of the word 'minimal'. As he points out, there is nothing minimal about any disorder - whatever its origin - that may be causing a serious learning problem.

On balance, the practising psychologist is unlikely to find much mileage in a debate regarding the presence, or lack of it, of possible brain damage in learning disabled children. Whether it exists or not, it is clearly not an area that is amenable to direct intervention strategies, and as such, the presenting problem remains to be faced in a pragmatic and realistic manner.

4.5 BRAIN DAMAGE AND LEARNING DIFFICULTIES - A MULTIMODAL VIEW OF THE LITERATURE

Clearly, any body of literature relating to possible brain damage will have a strong focus on the 'B' modality, which was the case in all the studies cited. However, some of the studies - most especially Hughes (1976) and Kirk (1967) - also make reference to elements of 'Be' modality and 'A' modality, a point also reinforced in Goldberg and Schiffman (1972).

Thus, it may be argued, that even in an area so clearly given over to biological consideration, there is a suggestion that other components in the individual's modality profile are important. This point is most clearly emphasised by Newton, Thomson and Richards (1979), who suggest that brain damage is merely one subset of a whole series of manifestations of learning difficulties.

5. PSYCHOPHARMACOLOGICAL ASPECTS OF LEARNING DIFFICULTIES

5.1 INTRODUCTION

Having considered the area of brain damage as it relates to learning difficulties, it would seem appropriate at this juncture to probe in more detail into a specific aspect of the biochemistry of brain function as it relates to learning problems. As an example, the DECP of the BPS, (DECP, 1983), cite the importance of myelination of the nerve fibrils of the brain - a process related to cell formation. It has been hypothesised that delayed myelination in specific areas of the brain may well be the cause of developmental dyslexia. The corollary of this biochemical speculation would suggest that certain pharmacological interventions may well significantly influence the manifestation of learning difficulties. Thus, it would seem appropriate to follow up such biochemical studies to ascertain the extent to which they throw light on the whole area of learning difficulties.

5.2 BIOCHEMICAL STUDIES

Wilsher et al (1982) provide some evidence that would tend to support the delayed myelination hypothesis. When dyslexic subjects were given the drug piracetam - which acts on the nerve fibrils of the brain - over an extended period of time running into months, they showed significant improvements in both the rate and accuracy of their reading, and the number of words written in free writing sessions.

Another line of biochemical research which appears not to have been very successful, concerns the hypothesis that the administration of

stimulant drugs may have the effect of increasing the subject's concentration span. Gittelman et al (1982) report that there was no enhancement of the attention span of children with learning difficulties throughout a trial with stimulant medication being prescribed. Aman (1978, 1980), in a review of the literature in this area, reports that stimulant drugs have not been shown to be effective in enhancing children's academic attainments. However, the root of this particular problem may well lie in mis-perceptions about the importance of attention span. Studies like those by Douglas (1976), show that stimulant drugs can increase concentration and selective attention. Stewart (1971), Comly (1971) and Sprague and Sleator (1976) all demonstrate that stimulant drugs lead to more controlled behaviours. However, the problem arises in as much as behavioural improvements and observable learning improvements are two quite separate things - and it is spurious to suggest that simply because attention span has been improved via a stimulant drug regime, that this must inevitably lead to an improvement in the child's learning. It may be tempting to infer that it ought to, but in reality the importance of other variables - such as motivation - clearly indicates that this need not necessarily be the case.

Another difficulty with drug interventions, would seem to be that many drugs have highly specific effects. For example, Guirgea (1971, 1973), in using the drug tiracetam, which facilitates transfer of information from one side of the brain to the other in animals, found that when it was used with human subjects, there was an improvement in their powers of verbal memory, but no significant

effect on any other aspect of learning was noted. Another related feature of drug regimes, is the fact that certain substances, while enhancing particular aspects of functioning may well concurrently inhibit other aspects. For example, Harshman et al (1974) demonstrated that marijuana improved certain aspects of visuo-spatial functioning, but concurrently resulted in the deterioration of verbal and analytical skills of the subjects who were taking it.

5.3 PSYCHOPHARMACOLOGICAL APPROACHES - SUMMARY

In general, although there are some interesting outcomes of drug studies, it would appear that consideration of learning difficulties from this perspective does not significantly add to the body of knowledge that could be used for both assessment purposes and subsequent remediation of learning difficulties.

The highly specific, and often idiosyncratic nature of the effect of drugs on an individual's functioning, would tend to make them relatively ineffective in attacking a problem like a learning difficulty, whose manifestation impinges on the whole area of an individual's functioning, not only in intra-individual terms, but also in more global environmental terms. A case may be made in a very small number of instances, for drug therapy to be used as an adjunct to other more overtly educational intervention strategies. For example, in a highly distractible and hyperactive child, it may be desirable to reduce the frequency of hyperactive behaviour and subsequently increase the child's concentration span prior to implementing any more overtly educational remedial programme.

5.4 PSYCHOPHARMACOLOGICAL APPROACHES - A MULTIMODAL VIEW OF THE LITERATURE

Again, the clear focus of studies in this area will be on the 'B' modality in terms of the biochemical interactions between drugs and brain function. However, it is clear throughout the literature that the effect of using drugs at the biochemical level, is to manifest observable changes in overt behaviours - such as attention span, concentration and general activity level. This clearly shows a relationship with the 'Be'modality, and the studies cited by Guirgea (1971, 1973), focus on verbal memory - an aspect of the 'C' modality.

6. VISION AND OCULOMOTOR FACTORS AND LEARNING DIFFICULTIES

6.1 INTRODUCTION

Obviously, vision and related issues represent an area that will be of interest when considering learning difficulties, as the visual field is a fundamental component in the reading process.

In this section the review will concentrate on the fundamental visual processes associated largely with the eye itself, and not with visual perceptual issues which are seen as a part of central information processing, and which are considered at a later point in the overall review.

Although issues surrounding vision have interested researchers for some time, there is an on-going topicality in this subject which is the focus of much popular debate at the time of writing.

6.2 EYE DISORDERS

Physical disorders of the eye, it is hypothesised, may have some relationship to a propensity for learning difficulties to occur in some subjects.

Gruber (1962) suggested that dyslexia may be a product of muscle imbalance or imperfect binocular fusion between the left and right eye. However, there appears little in the literature to support such a view or even related ones.

Goldberg and Schiffman (1972), in a review of the literature, point out that there appears little or no agreement that specific eye disorders are in any way related to an individual's reading ability. The

American Academy of Ophthalmology and The American Academy of Paediatrics conclude that there is no peripheral eye deficit which is responsible for dyslexia or any associated learning difficulty. In their review they point out that learning disabled children have an incidence of eye abnormalities similar to that found in non learning disabled control subjects. Flax (1968), re-emphasises this point by showing that peripheral visual defects are in no way related to dyslexia or related disabilities. Critchley (1970), also concludes, in looking at the literature, that potential eye defects cannot be identified as the cause of developmental dyslexia. As an example, Rubino and Minden (1971) reported that both the peripheral visual fields, and the central visual field of dyslexic subjects were well within normal limits. Douglas et al (1968) goes as far as to suggest that certain visual defects such as short sightedness may actually promote good reading.

Apart from the most serious and obvious forms of visual impairment - blindness or severe visual impairment - where a child's whole educational functioning can be directly affected, there appears little evidence to support the notion that relatively minor eye defects in any way relate to a potential susceptibility towards learning difficulties.

6.3 OCULOMOTOR CONTROL AND EYE MOVEMENT STUDIES

Much interest has been expressed as to whether or not the characteristic eye movements in children with learning difficulties, may, in some way, be related to the learning difficulty.

It is hypothesised that erratic or inconsistent eye movements may be detrimental in trying to follow the natural sequential flow of words and text. Bouma and Legein (1977) revived interest in this topic by suggesting that eye control might be a characteristic deficit in disabled readers. Lèisman and Schwartz (1976), had also suggested that problems of oculomotor functioning may be a major component in reading difficulties. They suggest that saccades - rapid eye movement from one fixation point to another, which all readers will subconsciously use in an efficient manner to scan text - is of particularly short duration and high velocity with learning disabled subjects, which does not allow enough time for the subject to effectively process material. Hence, it is hypothesised, such rapid eye movements may well be related to reading difficulties. Stanley (1975), suggests that rapid eye movements characteristic of children with learning difficulties result in new information being fed into the visual processing system before the old information is adequately dealt with. Festinger et al (1972) also reported reading errors associated with faulty eye movements, and Naidoo (1972) reported similar findings with spelling problems. Pavlidis (1978) suggests that dyslexic subjects appear to exhibit excessive frequency of eye fixations, and also appear to make more regressive eye movements from right to left, which is of course, contrary to the normal left to right flow of sequential text. Pavlidis, while accepting the evidence regarding eye movements in subjects with learning difficulties, still remains unconvinced that there is any causative relationship. Critchley (1970), Vernon (1971), and Simon and Ward (1978), were all of the opinion that erratic eye movement

characteristic of dyslexic subjects, is not the cause of the learning difficulty. Festinger et al (1972) are more specific in the suggestion that the abnormal eye movements in dyslexic subjects is, in general, an outcome of the reading problem and not a cause. Goldberg and Schiffman (1972) suggest that the erratic eye movements found in dyslexic subjects result from their inability to make sense of presented text, and represents an uncoordinated scan for meaning.

More recently, Pavlidis (1981) has sought to develop a non-verbal diagnostic technique for identifying dyslexia, based on eye movement studies. The technique is based on measuring eye movement patterns in fast, normal, slow and dyslexic readers. Pavlidis has shown that dyslexic subjects were unable to follow certain patterns exhibited by light emitting diodes. He considers that the erratic eye movement experienced by dyslexic subjects is due to oculomotor control difficulties, problems with ordering the sequence of text stimuli, or some faulty mechanism between the two. Pavlidis argues that such a technique which identifies these characteristic eye movements, may be a valuable assessment device, which would be independent of other variables such as socio-economic factors which often co-terminate the use of more standardised assessment techniques such as IQ tests and reading age measurements. Stein and Fowler (1984) report that remediation using one eye occlusion techniques - that is having the dyslexic subject wear a patch over one eye - can help a proportion of dyslexic subjects who have unfixed leading eyes, to achieve stable oculomotor retinal associations, which can subsequently help them in their reading - although not all researchers agree with these findings, eg: Newman & Lamb (1986). What is being suggested by writers like Stein & Fowler (1984), is that the dyslexic child with this form of difficulty

does not know precisely where their eyes are pointing when they try to read - a failure to make associations between oculomotor stimuli and retinal stimuli. In normal subjects it is assumed that oculomotor problems of learning to read are overcome by the development of a reliable 'reference' eye, which enables them to make stable and reliable oculomotor/retinal associations, using the one eye as a reference. As Stein and Fowler (1985) further point out, dyslexic subjects who have this unstable reference eye, tend to make visual rather than phoneme related errors when reading and writing. The occlusion process of one eye prevents the subjects from confusing the retinal images provided by the two eyes due to the subject's oculomotor problems. However, results suggest that not all dyslexic subjects benefited from this type of intervention - most especially those subjects who made not only visual errors but also phoneme and sequencing errors as well. Stein and Fowler (1985) conclude that approximately one sixth of children experiencing severe reading difficulties may benefit from such monocular occlusion, and the clear identification of the nature of the child's pattern of errors in reading would be a fundamental prerequisite in identifying children that may benefit from such an intervention.

A related line of research concerns a suggestion that dyslexic subjects often have an extreme sensitivity to light which may make black letters on a white page move about, blur or disappear. Irlen (1986) is reported to have found this characteristic in up to 75% of dyslexic subjects. The subsequent intervention involves having the subject wear tinted lenses. It is however pointed out that the evidence for

the efficacy of this approach is still unclear, and there are no standardised clinical research trials to refer to.

6.4 VISION AND OCULOMOTOR FACTORS - A SUMMARY

While there does seem to have been some interesting, and relatively exciting developments in the area of oculomotor functioning in learning disabled subjects, caution still has to be advised. Whereas rapid eye movements, oculomotor difficulties, and sensitivity to light may be characteristic of some learning disabled subjects, it would appear too simplistic to imagine that because such characteristics are relatively objectively measured, that diagnosis and relevant subsequent remediation should follow smoothly and naturally.

6.5 VISION AND OCULOMOTOR FACTORS - A MULTIMODAL VIEW OF THE LITERATURE

As would be expected in an area such as this, the vast majority of the studies focus on what would be seen as the 'B' modality, as visual processes are very much a feature of physiology. It could be argued that rapid eye movements represent an overt behaviour, and as such could be subsumed also under the 'Be' modality. Finally, Goldberg and Schiffman's view, (Goldberg and Schiffman (1972)), where they focus on the subject's ability to make sense of a presented text, has clear elements of cognitive processes, and consequently could be viewed within the 'C' modality.

7. MATURATIONAL LAG AND LEARNING DIFFICULTIES

7.1 INTRODUCTION

Not all brain function develops in a simultaneous manner, and it is hypothesised that children with learning difficulties may suffer from excessive delay of brain development in specific areas of their functioning. This, it is believed, will result in development being out of phase, and this will largely be responsible for many of the characteristics apparent in learning disabled children.

7.2 MATURATIONAL LAG STUDIES

Lowenberg (1979) points out that the temporal-parietal areas of the brain are the last to develop, and she found that E.E.G. recordings with learning disabled children reflected abnormalities in this temporal-parietal area of the brain, when compared to similar readings with control subjects - suggesting that this may be indicative of delayed maturation of this aspect of brain function. Yule and Rutter (1976) also agreed, and suggest that some relative delay in the normal maturation processes of brain function may well be a highly relevant factor in all forms of reading difficulty. Satz and Sparrow (1970) go as far as to suggest that in specific developmental dyslexia there is a maturational lag in the whole left hemisphere. They present four hypotheses regarding this:

1. Younger children in the age range 7-8 years, who exhibit reading disorders, tend to show a higher incidence of sensory motor and/or visual motor difficulties compared with older children who also experience reading disabilities. This, they suggest, can be explained by the left hemisphere suffering maturational lag.

2. The correlation that is found between mixed handedness, or ambiguous handedness, and reading difficulties, tends also to occur mainly with younger subjects - 5–7 years - which would be consonant with the left hemisphere maturational lag hypothesis.
3. Younger children (7–8 years) with reading difficulties, show a much higher incidence of sensory motor difficulties in tasks involving right to left discrimination, whereas older subjects with a reading disability (9–12 years), tend to show more conceptual impairments on such right to left discrimination tasks.
4. Older children (9–12 years), tend to show a higher degree of impairment in conceptual tasks related to language function, than do younger children (5–8 years).

Satz and Sparrow (1970) considered these hypotheses experimentally, and found no significant difference between normal and retarded readers in all early developmental aspects of laterality, such as manual preference, manual strength, dexterity and visual preference. However, they did find that the two groups were clearly differentiated in the later developing features of laterality, such as lateral awareness, finger differentiation, ear asymmetry and verbal intelligence. Satz finally concludes that perceptual problems are more likely to occur in younger reading disabled subjects, whereas, linguistic difficulties are more likely to occur in older reading disabled subjects. However, Vellutino (1979a) is not convinced by Satz's arguments, since children can deal with linguistic analysis from a very early age. Vellutino et al (1973) demonstrated that

when subjects were given perceptual tasks using novel visual stimuli - Hebrew words - there was no discernible difference between good and poor readers, suggesting that perceptual problems do not characterise reading difficulties. However, this position was further countered by studies by Benton (1975) and Satz and Van Nostrand (1973), which demonstrated developmental changes with disabled readers, in which the contribution of sensory motor perceptual skills became less important as reading bècomes more dependent on higher order linguistic strategies - results which would be consonant with a developmental lag hypothesis.

Vernon (1971) makes clear that it is quite uncertain whether all deficits which tend to be characteristic of dyslexics can be construed as similar to the characteristics exhibited by younger normal children. Specifically cited are weak lateralisation, poor left to right discrimination, reversals in reading and writing and visual perceptual difficulties. It is pointed out that many of the characteristics of dyslexics such as bizzare writing, spelling and distorted responses on tests like the Bender Gestalt, tend to closely resemble performances by adults suffering from some form of parietal lobe injury. Hence, Vernon suggests, these characteristics may not be developmental in nature, but may be more closely related to some form of minimal brain dysfunction.

De Hirsch et al (1966) and Doehring (1968) demonstrate that many of the characteristics displayed by dyslexic subjects even up to the age of fifteen, are similar to the characteristics associated with younger dyslexic subjects. In addition, the evidence suggests that many of these characteristics, especially in the area of spelling,

may never be fully overcome. This evidence would seem to run counter to a maturational lag hypothesis, and more supportive of a genetic or brain damage explanation. Other researchers would back up this view, most especially Silver and Hagin (1964), who identified continuing marked problems with nineteen year old reading disabled subjects, and Rawson (1968), who found that even in spite of intensive individualised coaching, dyslexic subjects still exhibited serious problems in both reading and spelling.

Rourke (1976) considers developmental lag in relation to brain dysfunction. He points out that a cerebral dysfunction hypothesis and a developmental lag hypothesis, would both be consonant with findings that learning disabled children are deficient in certain age appropriate skills and general reading performance. However, with the cerebral dysfunction hypothesis there would be no expectation that such children would ever catch up, whereas the maturational lag hypothesis would tend to suggest that given time and appropriate coaching, the difficulties could be overcome.

Rourke reviews the literature in the field, and concludes that the maturational lag hypothesis is possibly tenable in cases where the difficulty is relatively minor, and where it emerges at an early age, but that, in general, the evidence is distinctly equivocal. Yule and Rutter (1976) conclude that it cannot be assumed that children with reading difficulties will catch up as a matter of course. Thus, they emphasise the need for appropriate remediation strategies, and an awareness of the fact that children with learning difficulties are not simply slow learners. The Bullock Report of 1975 also emphasises the fact that the evidence points to an increasing gap

between good and poor readers over time - a factor which would run counter to a simple maturational lag hypothesis.

Spreen (1976) carried out a review of follow up studies, and concluded that in situations where children were identified at an early age as having learning problems, their outcome tended to be more optimistic, whereas children who were not identified until a much later stage had a poorer prognosis in terms of their future reading skills.

7.3 MATURATIONAL LAG STUDIES - A SUMMARY

As with much of the evidence in the whole area of learning difficulties, the maturational lag hypothesis provides a somewhat confusing and equivocal picture. It is possibly best that no firm conclusions are drawn, despite the fact that maturational lag is in itself an attractive theory. Gredler (1977) warns against equating the term "immaturity" with "maturational lag", as it is suggested that it tends in itself to produce a psychological set which absolves school personnel from any direct responsibility for helping such children.

7.4 MATURATIONAL LAG STUDIES - A MULTIMODAL VIEW OF THE LITERATURE

As before, much of the literature in this field concentrates on the 'B' modality, although reference to 'C' modality is notable in the studies focussing on sensory motor skills (Vellutino (1979a); Satz and Van Nostrand (1973)). The Yule and Rutter (1976) study while emphasising the limitation of the maturational lag idea, focuses more directly on the need for appropriate remediation, which brings in elements of 'Be', 'C' and 'Ip' modalities, in addition to the biological base of the lag in the first place.

8. HEMISPHERIC FUNCTIONING AND LEARNING DIFFICULTIES

8.1 INTRODUCTION

It has long been accepted that normal cerebral functioning is a pre-requisite for smooth cognitive processing, and considerable interest has been shown in the extent to which there may be a relationship between problems of cerebral functioning and learning difficulties.

An area of considerable interest has been the relative functioning of the two cerebral hemispheres. In the normal brain, information feeding into the right visual, auditory and tactile fields is processed in the left hemisphere, whereas information impinging on the left fields is initially processed in the right hemisphere. Broadly speaking, the left hemisphere is recognised to be dealing with verbal and language related processes, and the right hemisphere with predominantly non verbal processes. Consequently, it was hypothesised that damage in the left hemisphere may be related to difficulties experienced by children in learning to read, write and spell.

8.2 HEMISPHERIC DAMAGE

There is a suggestion by writers such as Coltheart (1979) that learning difficulties may be associated with left hemisphere damage. Coltheart describes what he terms as "deep dyslexia", which is characterised by semantic errors, visual errors, and an inability to convert visually presented letters to sounds. With the exception of Coltheart's position other writers are reluctant to consider the problems arising from actual damage in the hemisphere.

8.3 HEMISPHERE SPECIALISATION

More interest has been focussed on the specialisation features of the cerebral hemispheres, and the extent to which this plays a role in learning difficulties.

Goldberg and Schiffman (1972) demonstrated that the left hemisphere is dominant in language processes. Kimura (1971), and Kimura & Durnford (1974) have shown that the right visual field is superior in processing verbal material, whereas the left visual field is superior in processing non-verbal material. These findings are also supported by studies by McKeever and Huling (1970), and Davidoff, Cone and Scully (1978). It is, therefore, suggested that as the right visual field feeds directly to the left cerebral hemisphere, then problems with the left hemisphere and its specialisation functions may be related to reading and related language tasks.

Zaidel (1977), Bradshaw et al (1976), and Witelson (1977), have all shown that the left cerebral hemisphere is much better at processing analytical sequential information in general, such as might be presented in a page of text, whereas the right hemisphere is better suited to simultaneous and holistic processing. Farnham-Diggory (1978) also demonstrated that the right hemisphere has a propensity for holistic processing. Newton et al (1979) went somewhat further, in suggesting that the right hemisphere was superior in general global, visuo-spatial, and artistic skills, whereas the left hemisphere is superior in language, symbolic ordering, and analytical and discrimination skills.

While some writers have clearly focussed on the importance of the left hemisphere in the whole process of learning difficulties, others have emphasised the importance of the right hemisphere, and the coordination between the hemispheres. Kershner (1975) emphasised the importance of spatial relationships, depth perception, and other visuo-spatial skills, in the reading porcess, and pointed out that these are generally seen as right hemisphere processes. Farnham-Diggory (1978) suggests that reading and writing clearly involve both hemispheres. She suggests that learning difficulties may arise:

1. As a result of problems in moving information from one hemisphere to the other.
2. As task specific problems in one hemisphere.
3. As task specific problems of overall control with the left hemisphere.

So far as the role of coordination between the hemispheres is concerned, the evidence is somewhat conflicting. While the study by Yeni-Komshian, Isenberg and Goldberg (1975) has shown that reading problems appear to be associated with a dysfunction of inter-hemispheric transmission, there are other writers such as Vellutino (1979b), who suggest that there is no evidence to support the notion that reading problems are in some way caused by a problem of hemispheric transmission.

Despite the complexity of such studies, and the difficulties associated with fully understanding hemispheric processes, it would appear that the advantages of hemispheric asymmetry outweigh any disadvantages, and hence learning difficulties may be more prevalent in subjects who do not have a well established cortical dominance.

8.4 CEREBRAL DOMINANCE

Some studies have focussed on the developmental nature of cerebral dominance, and the extent to which it is related to learning difficulties.

Seth (1973, 1975) suggests that hemispheric asymmetry is developmental over time, and not something established at birth, a point of view reinforced by Leong (1976). Witelson (1976) found differences in hemispheric functioning for boys as opposed to girls, and uses a developmental model to explain why learning difficulties may be more prevalent in boys than in girls. Her study found that the right hemisphere develops control of abstract haptic form recognition in boys by approximately age 6 years, but tends not to appear in girls until as late as 14 years. These results suggest that because in girls the right hemisphere has not taken control, they recognise abstract haptic forms equally well with either hemisphere, whereas boys do better with the right hemisphere. However, dyslexic boys appear to do equally well with either hemisphere - like girls - and have a left hemisphere that does right hemispheric processing. Thus, Witelson postulates that dyslexic boys not only have a left hemisphere problem, but also have a left hemisphere which is coping with extra right hemispheric skills.

There have also been a considerable number of studies suggesting that poorly established cerebral dominance is a factor associated with reading and related disabilities. Klasen (1972) identifies inadequate cerebral dominance as a major feature of dyslexic problems, a point of view shared by Bakker (1974).

8.5 LATERALITY

Generally speaking, it is taken that lateral preference is an indicator of hemispheric dominance, although there is some dissent on the issue. Gredler (1977) suggests that cerebral dominance refers to which of the two hemispheres has specific function control, or more general control, whereas laterality refers to an awareness in the subject of left and right. Tansley and Pankhurst (1981) question the use of body laterality as an index of cerebral dominance, on the grounds that it is too crude on index. In studies with learning disabled children measures of laterality have generally been hand preference, eye preference and ear preference, with foot preference also being used from time to time.

Naidoo (1972) found evidence of left hand preference, left eye preference, left foot preference, cross laterality and mixed dominance more prevalent in children with learning difficulties, compared with matched controls, although the differences were not statistically significant. Farr and Leigh (1972) did find a significant correlation between reading difficulties and indeterminable eye dominance, and also between reading difficulties and a tendency to ambidexterity in the subjects. Newton (1970) found a significantly higher percentage of dyslexic subjects with mixed laterality compared with control subjects. Kinsbourne and Warrington (1963) and Rutter, Tizard and Whitmore (1970) all found a significant correlation between reading difficulty and poor left/right discrimination in children. Thomson (1975) suggests

that a significant feature of reading difficulties is an individual pattern of inconsistency in laterality, and that laterality can be considered merely as a predictor, as opposed to a cause of reading difficulties. Sawyer, Lord and Brown (1979) found that the degree of right lateral preference estblished is related to reading ability only for less able children, and that it was likely that the more able non-right lateral preference children, were able to adopt compensatory mechanisms which rendered them less susceptible to reading difficulties. A review of literature by Beaumont and Rugg (1978) suggests that the relationship between laterality and learning difficulties may be due to a dissociation between auditory and visual language lateralization, which is more likely to occur in left handed or mixed handed subjects.

Having considered some of the more general issues and findings regarding laterality and learning difficulties, it would be important at this point to take a more detailed view of the whole process, by considering the research which focuses on information being channelled through specific sensory routes - auditory and visual. Studies using dichotic listening techniques and visual half field techniques, are used in this regard. The assumption underpinning such techniques is that hemispheric dominance can be inferred from either ear or eye asymmetry.

1. DICHOTIC LISTENING STUDIES

Dichotic listening studies are based on techniques of being able to channel auditory stimuli to one or other ear exclusively, thereby giving access to a particular hemisphere as the first stage of processing.

Taylor (1969) in an early study, found a right ear advantage (REA), in both poor and good female readers, but no REA in poor readers of the same age who were male, suggesting a developmental lag in left hemispheric verbal functioning in the group of poor male readers. Kimura (1967) in a study of male subjects who were older (12-14 years), found a REA, and concluded that the normal developmental lag is accentuated in male subjects with reading problems.

However, there are some studies showing contradictory findings in this area. Bryden (1970) demonstrated a REA in both good and poor male readers, whereas Zurif and Carson (1970) reported no evidence of REA in either good or poor readers. Further studies by Satz, Rardin and Ross (1971), Bakker (1973), found some evidence of REA, whereas Witelson and Rabinovitch (1972) found no evidence of REA with learning disabled children.

Clearly, the evidence is conflicting, and at best it may be said that in certain instances lateral preference as demonstrated by ear advantage may be an associated factor in children with learning difficulties.

2. VISUAL HALF FIELD STUDIES

Visual half field techniques provide for visual stimuli to be channelled to one or other hemisphere by exclusive use of the associated visual channel. As with the dichotic listening studies, the visual half field studies also tend to show a conflicting pattern of evidence.

McKeever and Huling (1970) found no support for delayed hemispheric dominance in disabled readers, whereas Yeni-Komshian et al (1975) reported significant right visual half field asymmetry for both numerals and words, with poor readers.

8.6 THEORETICAL ISSUES IN HEMISPHERIC FUNCTIONING AND LEARNING DIFFICULTIES

Several attempts have been made to draw together theoretical formulations in this whole area. Firstly, the maturational lag hypothesis can be considered.

Researchers such as Bakker (1973), Kinsbourne (1975) and Satz and Sparrow (1970) suggest that subjects with learning difficulties have experienced a maturational lag in their lateralisation of hemispheric functioning. On the other hand, Beaumont and Rugg (1978) reject the maturational lag hypothesis on the grounds that there is no evidence for a maturation of the lateralisation of cerebral language processing, and that there has also been no attempt to specify the nature of the connection between any developmental lag and some aspect of the learning experience that would lead to a reading disorder. Vellutino et al (1973,1975) suggests that the nature of the dyslexic problem lies in a deficit in visual to verbal transfer, and therefore lies to some extent in inter-hemispheric integrations.

Beaumont and Rugg (1978) would also promote this view, suggesting that in the learning disabled subject there is a relatively bilateral processing of visual to verbal stimuli, and not a unilateral processing in the left hemisphere. This, they suggest, leads to a dissociation

of the two processes normally integrated in the left hemisphere, by the bilateralisation of one, leading to integration difficulties.

8.7 HEMISPHERIC FUNCTIONING - A SUMMARY

The whole area of hemispheric functioning as considered in studies of laterality and cerebral dominance presents a contradictory picture.

There is evidence that some poor readers present with laterality problems, but as writers such as Balow (1963), Clark (1970) and Rutter et al (1970) point out, it is not necessarily valid to extrapolate from a clinical situation to the population as a whole. Satz (1976) emphasises that it is necessary that more research be carried out with normal children of specified age ranges, before extrapolation from clinical groups could be considered valid. As Singleton (1976) points out, the majority of children with laterality problems do not have reading problems, and Goldberg and Schiffman (1972) also point out that dyslexia is not more frequent in children who are poorly lateralised than in the population as a whole. Anthony (1968) takes a fairly pragmatic view in suggesting that established or mixed laterality may not in itself be a predictor of reading performance, but may be present in combination with other variables, which would lead to reading difficulties.

8.8 HEMISPHERIC FUNCTIONING - A MULTIMODAL VIEW OF THE LITERATURE

Clearly, hemispheric functioning is a feature of the 'B' modality, although the studies used to gain access to these processes tend to

rely on Sensory - 'S' modality, and Cognitive - 'C' modality, processes. Finally, issues of laterality as measured by hand, eye, foot preference do involve aspects of overt behaviour - 'Be' modality.

9. SENSORY PERCEPTION AND LEARNING DIFFICULTIES

9.1 INTRODUCTION

Perception is generally seen as the process whereby external sensory impressions are transmitted to, and interpreted by, the brain. Perception could thus be considered as occupying a somewhat intermediary position between initial sensory processes, and subsequent cognitive processing. It could be argued this forms an aspect of the whole Information Processing model, which will be considered in Section 10, but the literature specifically on perceptual factors justifies separate consideration.

9.2 GENERAL PERCEPTUAL DIFFICULTIES

Steinheiser and Guthrie (1977) see perceptual and de-coding problems as the main source of difficulty for the disabled reader. Trieschman (1966) reports that disabled readers make many more perceptual errors than matched samples of normal readers. Whipple and Kodman (1969) found that children with reading difficulties had perceptual abilities which were much poorer than normal readers matched for IQ. Kass (1966) reported a correlation between difficulties in learning to read, and tests of perceptual speed, although subsequent studies by Valtin (1978) and Machemer (1973) failed to support Kass' position.

Bean (1967) reported a significant difference in Bender Gestalt scores between retarded and normal readers, while Goldberg and Schiffman (1972) reported that the Frostig Test of Visual Perception discriminates between good and poor readers on measures of visual perception, but they noted - as does much of the subsequent evidence - that the related perceptual training exercises are of little value in

redressing the reading difficulty. In fact, Olson and Johnson (1970) suggest that the Frostig Test is not a good predictor of reading ability.

Allington et al (1976) hypothesise that in perceptual tasks the major problem for the child with learning difficulties is in making verbal associations of visually presented images. Done and Miles (1978) support this view with a study which showed that dyslexics had a far greater problem with tasks which involved verbal labelling than did control subjects. Cashdan (1970) holds a slightly different view, however, by suggesting that the difficulties experienced by the child with learning difficulties, lie more in their willingness to attend, plan, and subsequently label visually presented material, than in any intrinsic failure of perceptual ability. Wedell (1977) adopts a somewhat more cautious and pragmatic approach, by suggesting that with the child with learning difficulties, perceptual problems are likely to be a contributary factor, but not a determining cause of reading problems per se.

9.3 PERCEPTION AND MATURATIONAL LAG

Wedell (1977) reports that perceptual factors may be more important at the earlier stages of reading, whilst at later stages other skills such as decoding and extrapolation become more central to the process. Writers such as Fletcher and Satz (1979) point out that the development of intellectual functioning is such that the maximum development of perceptual abilities occurs between 3 years 6 months and 6 years, with more overtly linguistically related factors being important from about 9 years on. Thus, children with perceptual

difficulties could be viewed as operating at an immature developmental level, and older readers with perceptual problems and related difficulties, may be viewed as suffering from a developmental lag. Thomson (1979) studied subjects who had perceptual difficulties associated with their learning problems. In the early stages of development there appeared also to be related emotional difficulties. However, by early adolescence there was no longer any evidence of the perceptual problems, although the emotional difficulties still persisted. Thomson suggests that although the natural development of the child has overcome the perceptual problems by adolescence, the learning difficulties still apparent are more likely due to the developmental gaps occasioned by the earlier perceptual difficulties, and the continuing emotional difficulties are the main feature in the process.

9.4 VISUAL PERCEPTION

There has been considerable interest in the specific area of visual perception as it relates to learning difficulties.

Fildes (1921) in a very early piece of work, reported weaknesses in visual discrimination and visual memory in non readers. More recent work by Gredler (1969), Gibson (1966) and Flax (1968) have tended to support these early findings. Richardson (1974) suggests that dyslexic subjects may lack a visual cartesian frame of reference which they can use to facilitate the order and flow of their reading.

Pumfrey and Naylor (1978) found that poor readers presented with deficits in visual sequential memory, while Thomson & Newton (1979) reported a correlation between both symbolic and visual sequential

memory, and poor reading performances in dyslexic subjects. Goldberg and Schiffman (1972) reporting a significant positive correlation between visual sequential memory and reading ability, suggest that reading difficulties may be the direct result of a lack of coordination among a variety of visual functions necessary in the reading process.

On the other hand, there continues to be controversy over visual perceptual performance, as it relates to reading difficulties. Naidoo (1972) found no difference between subjects of average ability with reading difficulties, and subjects who were merely slow learners because of below average general ability, on tasks of visual attention. Valtin (1978) goes even further, suggesting that any failures a dyslexic subject may have, are in no way connected with problems of visual perception. Fletcher and Satz (1979) suggest that visual perceptual problems may be a function of immaturity, and are, in effect, a result of, and not a direct cause of reading problems. Thus, again, there is the debate surrounding the direction of any causative relationship - are reading problems caused by visual perceptual problems, or are visual perceptual problems the result of reading difficulties? Singleton (1976) takes a cautious line, by suggesting that visual perceptual difficulties may be a characteristic of some children with learning difficulties, but by no means of all such children.

9.5 AUDITORY PERCEPTION

As is the case with visual perception, much interest has also been focussed specifically on the role of auditory perceptual processes as they relate to learning difficulties.

Henry (1975), suggests various aspects of auditory perception that may cause problems, and which may be present in children with learning difficulties:

- an inability to synthesise sequences of spoken words.
- a poor general phonic knowledge, including a lack of basic phonic rules.
- confusion over short vowel digraphs.
- an inability to analyse words into naturally occurring auditory units.

Henry suggests that the learning difficulty may be associated with a shortcoming in any of these processes, and may manifest in a variety of ways. These specific aspects of auditory perception can be considered in greater detail.

9.5.1 AUDITORY DISCRIMINATION DIFFICULTIES

Auditory discrimination is defined as the subject's ability to distinguish between orally presented words or sounds which have similar or dissimilar phoneme groupings, and there have been many studies which appear to show defective auditory discrimination in subjects with reading difficulties. Typical of such findings would be studies by Wepman (1960, 1962), De Hirsch et al (1966) and Valtin (1973). Nelson (1974), and Lanyon (1974) also reported poor auditory discrimination in backward spellers. A strong positive correlation between auditory discrimination and reading ability was reported by McNinch and Richmond (1972), Cotterell (1972) and Goldberg and Schiffman (1972).

There are, however, several studies which do not support this position. Silver and Hagin (1967) found no significant difference between groups of normal subjects and subjects with reading difficulties on tests of auditory discrimination, an outcome supported by Naidoo (1972). A large scale study by Dykstra (1966), in which several measures of auditory discrimination were used, reported uniformly low correlations with reading achievement, regardless of the measure used. Dykstra concluded that a standard I.Q. score could be taken as a better predictor of reading achievement than any auditory discrimination measure.

Vellutino (1979b) questioned whether the methodology used in assessing auditory discrimination was indeed valid, and suggested that there was a danger of spurious conclusions about auditory discrimination being deduced from certain measurements.

9.5.2 AUDITORY MEMORY DIFFICULTIES

There has been a significant body of work which suggests that subjects with poor auditory memory are more likely to have learning difficulties. Results to this effect have been reported by Hendry (1969), Tansley (1967) and McNinch, Palmatier and Richmond (1972). McKeever and Van Deventer (1975) found that chronic dyslexics who are right handed possess an auditory memory deficit for verbally presented material. Newton et al (1979), in their work for the Aston Index, found that poor auditory memory in sound blending was a factor significantly associated with reading difficulties.

Another aspect of auditory memory is auditory sequencing. Auditory sequencing refers to the subject's ability to recall orally presented

material in a proper time related sequence. Studies by Cotterell (1972), and Goldberg and Schiffman (1972), both report a significant positive correlation between auditory sequencing ability and reading. Richie and Athen (1976) found that children with reading difficulties performed significantly less well on tasks requiring auditory retention and subsequent sequencing recall. Isom (1969) reports that poor readers were significantly poorer in working with sequentially presented material, compared with matched controls. This phenomenon was most noticeable in material presented in the auditory domain.

There are, however, some studies which do not show this correlation between auditory sequencing and reading ability. Kass (1966) and Macione (1969) both found no difference between normal and disabled readers on tests of auditory sequential memory, clearly casting doubt on the generality of sequencing problems in subjects with learning difficulties.

9.5.3 AUDITORY RHYTHMICITY

Tansley (1967) found that subjects with reading difficulties often lacked a rhythmic approach to reading, suggesting that the rhythm generated by auditory perception of sequential text may be a factor in reading difficulties. It was also suggested that there may be a relationship between this lack of rhythmicity and some of the gross motor problems such as clumsiness and lack of coordination, also found in some subjects with learning difficulties. Wisbey (1977) suggests that learning disabled children would benefit directly

from receiving remedial musical tuition, which could be used to inculcate the basis of rhythm, the suggestion in this instance being that the establishment of rhythmicity in a musical context would generalise to the subject's reading.

9.5.4 AUDITORY PERCEPTION - SUMMARY

In general terms, studies involving auditory perception have proved a fertile research ground for psychologists looking at learning difficulties. However, as has been shown, the evidence is often lacking in clarity, and at times, somewhat contradictory.

Goodacre (1979), suggests that research in this area is open to question regarding the validity of the measuring instruments, and the general relationship between perceptual ability and global intelligence.

There does, appear to be some evidence of an association between reading and auditory perception, but this association may only be relevant in a particular subset of subjects with learning difficulties, as Tallal (1976) points out.

9.6 SENSORY PERCEPTUAL INTEGRATION

Clearly human functioning requires the smooth integration of the various perceptual processes, and some studies have focussed on this area of integration - most especially the integration of auditory and visual processes.

Birch (1962) reports that poor readers were less able to translate visual information to auditory patterns than matched controls, a finding confirmed by Blank and Bridger (1966). Flax (1968) describes

dyslexia as a complex combination of visual and auditory perceptual difficulties. Doehring (1968) sees auditory and visual sequential integration disturbances as being a ubiquitous feature of the dyslexic type of problem, and hypothesises that the difficulty lies in the translation of visual symbolic information into sound information, an ability that is seen as crucial in tasks such as reading. Cashdan (1970) and McNinch and Richmond (1972) report that good readers are far better than poor readers on tasks of audio visual sequencing, a finding reinforced by Doehring and Hoshko (1977). However, other writers do not find this connection. Bruininks (1968) reports that audio visual integration ability is not significantly correlated with reading achievement. Vellutino (1979b) reports that there is no real evidence to support an inter-sensory deficit model in explaining reading difficulties, arguing that many of the studies fail to control adequately for intro-sensory deficits. Wedell (1977) does not see visual and auditory perception as important in the later stages of learning to read, when other skills such as de-coding became more important. Kahn and Birch (1968) present results which would tend to support Wedell's position. They show a correlation between auditory/visual integration tasks and reading ability only at the younger age ranges. Ford (1967) reported that any association between audio visual integration and subsequent reading deficits vanishes when subjects are matched for IQ - again providing evidence to suggest that an IQ score is a more reliable predictor of reading achievement.

Other researchers have considered other aspects of sensory integration. Koppitz (1964), Rosner and Simon (1971), and Rosner (1973) report that visual motor integration problems are related to reading difficulties. Visual motor integration may relate to the skills associated with

tracking and assimilating the written word, and so problems here may be associated with a reading problem. De Hirsch et al (1966) report that Bender Gestalt scores - a measure of visual motor functioning - are good predictors of subsequent reading achievement, a point also emphasised by, Owen et al (1971). Vellutino (1979b) is more critical, suggesting that tests of visual motor ability are more likely to be measuring an aspect of problem solving strategy, as opposed to perceptual functioning, and as such it is incorrect to draw any direct links between reading ability and visual functioning.

9.7 SPATIAL SENSORY PERCEPTUAL SKILLS

There is also evidence of a connection between a subject's spatial abilities, and the likelihood of associated learning difficulties.

Weschler and Hagin (1964) suggest that poor spatial ability may have some relationship with reading difficulties, although the nature of such a relationship is unclear. Seymour and Porpodas (1978) suggest that dyslexia is associated with a problem of quasi-spatial coding of arrays of elements, and is related to the subject's awareness of his/her body in space. Thus, it is suggested, the difficulties of encoding arrays of elements such as in written text, have the same root cause as the problems the subject has in getting orientated in space. Belmont and Birch (1963) suggest that problems in a subject's ability to discriminate left from right occurs more frequently in dyslexic subjects, although Benton (1959) believes such left/right discrimination is a function of general ability as measured by IQ score. Miles and Ellis (1980) suggest that implicit verbalisation is always a factor in apparent spatial directional

tasks, and that the problems experienced by dyslexic subjects may more likely be as a result of inadequate labelling, rather than as a result of any spatial directional difficulties as such. Vellutino (1979b) also suggests that there is little evidence for spatial or directional confusion being associated with reading difficulties, believing instead that the problem lies in the subject's labelling strategies.

Another aspect of spatial abilities concerns the perception of form and structure. Form perception difficulties in subjects with reading problems have been reported by Monroe (1932), Benton (1962) and Gehring (1966).

However, Valtin (1978) and Jorm (1978) have both reported that dyslexic subjects showed no evidence of spatial difficulties, findings also supported by Kaufman and Biren (1976). Stanley (1975) also reports no differences between dyslexics and normal control subjects on tests of form perception.

Vernon (1971) reviewed the literature in this whole area, and concludes that dyslexics may suffer from what she describes as an impaired capacity to reconstruct figures in which spatial dimensions and relationships of the part to the whole, have to be copied correctly. Witelson (1977) hypothsises that in dyslexic subjects both cerebral hemispheres contain representations of spatial information, which produces an overload in the left hemisphere, interfering with the natural verbal and language functioning, in turn leading to dyslexic and related difficulties. Witelson's research supported this hypothesis, but it has not since been replicated.

9.8 PERCEPTION AND LEARNING DIFFICULTIES - A SUMMARY

In both the research and the applied fields, interest in perceptual issues appear less central than used to be the case, in looking at children with learning difficulties. The hypothesis that perceptual abilities are subject to maturation, and that they are consequently more important in the early stages of reading, is a generally held belief within the field. The research, once again, tends to the conclusion that perceptual difficulties may be associated with reading problems in some instances, but not in all. They are generally seen as associated variables and not directly causative.

9.9 PERCEPTUAL DIFFICULTIES - A MULTIMODAL VIEW OF THE LITERATURE

There is a considerable and varied literature on this topic of perception, and generallly speaking any perceptual sensory ability clearly has relationships with the 'B' modality. However, much of the literature focusses on Sensory issues - 'S' modality, and cognitive issues 'C' modality, and in some of the studies, elements of overt behaviours were touched upon - 'Be' modality (eg: Cashdan (1970); Tansley (1967)). Emotional factors were also touched upon - 'A' modality (eg: Thomson (1979)).

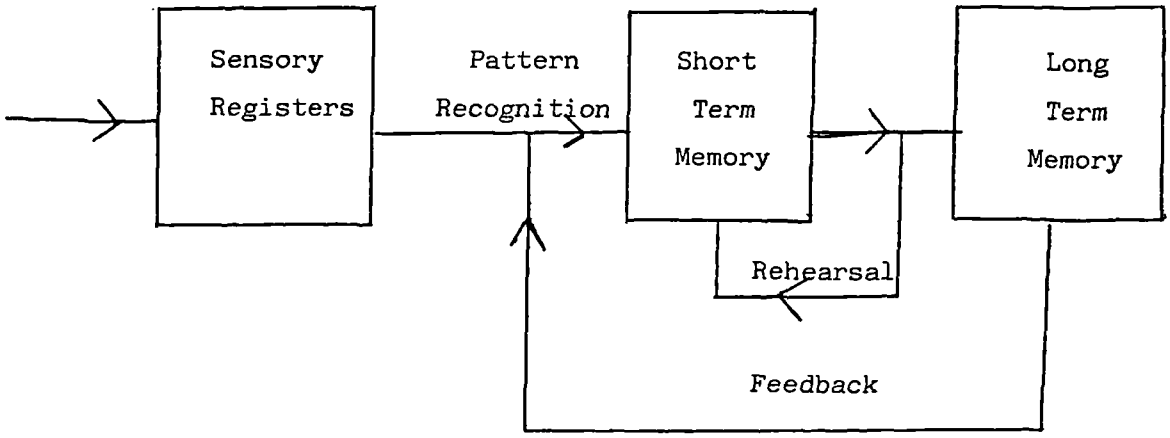
As before, there is evidence in the literature that taking a multimodal view opens out the elements that are being considered.

10. INFORMATION PROCESSING AND LEARNING DIFFICULTIES

10.1 INTRODUCTION

Psychologists have long sought to create models which would allow them to develop an understanding of cognitive brain processes. Such models seek to describe these cognitive processes, and as Farnham-Diggory (1978) points out, this should allow the researcher to make inferences about what a subject is doing inside his/her head, as a given task is performed. Such an understanding, it is hypothesised, would give clues to appropriate action when the process goes wrong, as in the case of a reading difficulty, for example.

Atkinson and Schiffrin (1968) have developed the model of these processes which tends to be ubiquitous in the literature. The following outline of the model, as presented by Klatsky (1975), is typical:



1. SENSORY REGISTERS

Incoming stimuli are stored in one of the five potential sensory registers - most commonly vision and hearing with regard to learning. The stimuli are stored for extremely short periods of time, and are pre-categorical - they have not yet been recognised and subsequently categorised.

2. PATTERN RECOGNITION

While the information is being stored very briefly in the sensory registers, it is compared with previously acquired knowledge, and categorised accordingly. The effect of the categorisation allows the stimulus to move on to short term memory storage.

3. SHORT TERM MEMORY (STM)

Recognised information is retained in a temporary or short term memory storage. Information held in STM decays relatively quickly - in a time scale of seconds - unless it is rehearsed. By the use of rehearsal, the information may be retained and worked upon in STM. It is widely assumed that the form of storage in STM is auditory and articulatory, not visual.

4. LONG TERM MEMORY (LTM)

Information may be transferred from STM into what is seen as long term storage. The LTM holds a vast amount of differing information including semantics, temporal information, grammatical structures etc. Once information is in LTM, the problems that may arise are ones of retrieval as opposed to storage.

The literature in the whole information processing field is vast, and it would be the intention of this brief review to give an overview of the area within the context of learning difficulties.

10.2 SENSORY PERCEPTION AND PATTERN RECOGNITION

Many of the issues that might be relevant in this context were considered under the Section on Perception, but there are other

points more directly relating to the information processing model that are worthy of consideration.

10.2.1 VISUAL PROCESSING

Early studies by Sperling (1960) suggested that information could be retained in the visual register for between 200 m.sec. and 300 m.sec. Stanley and Hall (1973) found that for normal readers, an interval of at least 100 m.sec. between stimuli was necessary for accurate recognition, whereas with dyslexic subjects the inter-stimulus interval required to be at least 140 m.sec. Thus, it would appear that dyslexic subjects required considerably longer to correctly identify concurrent stimuli, suggesting that they may find information decaying from initial visual sensory storage before accurate recognition has taken place.

Vellutino (1979b) however, suggests that the results obtained by Stanley and Hall may be explained in terms other than that of initial visual processing characteristics. Vellutino feels that the results may be due to subjects adopting a more conservative strategy of responses, in which they attempt to be certain about what they see before attempting to report it. Alternatively, Vellutino suggests that the results may be a function of the more general difficulty that poor readers have in labelling letters. Other studies by Fisher and Frankfurter (1977), and Morrison, Giordani and Nagy (1977) also cast doubt on Stanley and Hall's interpretation, and Vellutino (1979b), on reviewing the literature, reports that studies not supporting the Stanley and Hall hypothesis by far outnumber those that do.

Sakitt (1976) suggests that the function of the visual sensory storage is to allow the non-categorised visual images to be retained long enough for the relevant features to be recognised and subsequently passed on to the STM. Riding and Pugh (1977) demonstrated that the duration of this 'iconic' sensory storage was correlated with reading performance - the longer the iconic storage the better the reading performance.

10.2.2 AUDITORY PROCESSING

There appears less certainty in the literature as to the role of auditory processing in reading. Tallal (1981) suggests that children who cannot process auditory information fast enough - up to about 100 m.sec. - will mishear, or not be able to discriminate the whole syllable, which may lead to reading problems, since a lot of teaching and feedback in the learning process is done orally, requiring auditory processing.

10.2.3 PERCEPTUAL MASKING

Perceptual masking refers to the phenomenon whereby previously presented stimuli make subsequent stimuli less clear - forward masking, or where existing stimuli are interfered with by further subsequent stimuli - backward masking.

Backward masking experiments are used to determine the duration of iconic sensory storage, and this has led Miles and Ellis (1980) to suggest that the difficulties experienced by dyslexic subjects are possibly due to interference of information by subsequent stimuli, rather than by a simple decaying mechanism from the iconic storage.

In reading, one particular letter/word is liable to be 'masked' by the next one in the sequential text. The fact that dyslexic subjects appear to have greater problems than normal readers with 'backward masking' experiments tends to support this interference hypothesis. Farnham-Diggory and Gregg(1975a)suggest that the dyslexic child may have such difficulties because their pattern recognition system operates slowly. Consequently, the child may be open to a build up of interfering stimuli which will have a cumulative effect on the child's ability to cope with the material that is being presented. This, it is hypothesised, leads to an increase in the general anxiety level, leading the child's performance to deteriorate even further.

10.3 SHORT TERM MEMORY

Short term memory store - or working memory to use the term preferred by Farnham-Diggory (1978) - is where recognised stimuli are stored for relatively short time periods in order to extract meaning and structure. STM is a limited capacity storage which allows anywhere between four and seven chunks of information to be stored for a limited time span, unless rehearsed. Miller (1956) suggested that STM storage was approximately seven plus or minus two chunks or units of information. If there were difficulties with STM storage which, say, resulted in much less information being stored, or worked on, at any given point in time, then this may inhibit an individual's attempts to put meaning and structure onto units such as words and phrases, leading to dyslexic type difficulties.

In studies where subjects had to search for a probe word embedded in a sentence, Katz and Wicklund (1971) found that dyslexic subjects

took much longer compared to normal readers. They suggest that this is because poor readers have difficulty in maintaining information in STM long enough in order to carry out the comparison tasks necessary to identify the probe word. A series of studies by Goyen and Lyle (1971a, 1971b, 1973,) demonstrated that poor readers were much worse than normal readers on various matching tests when under timed conditions - suggesting problems with STM. Vellutino (1979b) suggests that the results may have been due to encoding difficulties or problems with rehearsal, rather than actual problems of maintaining information in STM storage.

Doehring (1968) reported that dyslexic subjects and normal readers were differentiated on some tests of STM, but not on all, suggesting that the problem may not simply be in STM capacity. Liberman and Shankweiler (1978) provide evidence to support Vellutino's suggestion that the problem may be an encoding one. They found that poor readers were slightly better than good readers in STM storage for nonsense designs, and that the two groups were more or less comparable in face recognition studies. However, poor readers did significantly less well than good readers in the recognition of recurring nonsense syllables. This led Liberman and Shankweiler to hypothesise that good readers encoded information phonetically, and were more able to hold information in STM by means of rehearsal, than was the case with poor readers.

10.4 LONG TERM MEMORY

Once information has been stored and 'worked on' in STM, and meaning successfully extracted, then it is free to enter into long term permanent storage.

10.4.1 SEMANTIC MEMORY

A major aspect of LTM is the process whereby information entering LTM is labelled in an appropriate manner in order to make it more meaningfully available for subsequent retrieval.

Spring and Capps (1974) found that subjects' ability to name - and thus associate meaning to - items, was a skill which became more proficient with age, suggesting a gradual semantic network development in LTM over time. They also found that normal readers tended to perform much faster than poor readers - especially on tasks requiring the naming of digits. Spring and Capps suggest that good readers engage in more efficient rehearsal strategies compared with poor readers, which would facilitate information entering LTM in a logical and coherent manner, thus maximising the chances of subsequent retrieval. Further studies by Swanson (1977), Torgesen and Goldman (1977), and Bauer (1977) showed a similar pattern of poor rehearsal strategy with poor readers. Denckla and Rudel (1976) looked at the performance of dyslexic subjects on tests which were requiring the subject to rapidly name presented stimuli, such as pictures, colours, letters and digits. They discovered that objects and letters were more difficult for dyslexic subjects to name rapidly compared with controls. The suggestion made was that the dyslexic subject has a difficulty in automatically verbally naming such visual stimuli as are most associated with reading processes, and the root of the problem lies in the matching process with previously stored information in the semantic aspect of LTM. Other studies have also looked at verbal labelling performances. Done and Miles (1978) found differential performances by dyslexic subjects in tasks involving ordering of digit sequences and ordering of nonsense shapes.

The difference between dyslexics and normal readers was greater in the case of the correct ordering of digit sequences, which it is argued, requires verbal labels, than was the case in the ordering of nonsense shapes, where verbal labels are harder to assign.

Cohen and Netley (1978) found that dyslexic subjects have problems associated with an inability to put a serial string of letters together, rather than an inability to recognise individual letters or words. Vellutino, Steger, De Setto and Phillips (1975) suggest that an inability to recall individual letters may not be associated with poor reading as such. They point to deficiencies in the processing system rather than to problems of matching from LTM.

Shankweiler and Liberman (1976) stress that reading processes involve the storing, indexing and retrieval of information from LTM, and they suggest that this may be done using a phonetic code. They argue that poor readers are less able to construct and use a phonetic code compared with normal readers. Steinhauser and Guthrie (1977) support this hypothesis, arguing that phonetic code processes are more readily learned by normal readers than by dyslexics.

Other studies by Perfetti and Goldman (1976), Perfetti and Hogaboam (1975), Perfetti, Finger and Hogaboam (1978) and Perfetti et al (1977) also highlight the problem that dyslexic children have in processing connected text. They suggest that poor readers have less efficient coding of linguistic units no smaller than a word or syllable, which leads to difficulties in using any semantic information that may be encoded in such units.

Farnham-Diggory and Gregg(1975b) looked at both memory span and at the subject's memory scanning strategies. They found that in good readers, auditory scanning and visual scanning of memory tended to proceed at approximately the same rate. However, poor readers appeared to be more efficient than good readers at scanning visual elements, but were significantly less efficient at scanning auditory elements. Over time, this led to an increased discrepancy between auditory and visual memory scanning speeds in the poor readers. The writers suggest that poor readers move onto the next visual element in a piece of text, before the associated auditory element has been retrieved from LTM, leading to subsequent reading difficulties. This position assumes the involvement of auditory phonetic codes, a concept which is by no means accepted by researchers in this field.

10.4.2 SEQUENCING, ORIENTATION AND LONG TERM MEMORY

Vernon (1979) in a review of the literature shows that there are many studies in which dyslexics perform significantly less well on tests of visual sequential memory, than do normal readers. It can be argued that LTM processes become involved here in terms of pattern recognition. Pollock and Waller (1978) suggest that visual sequential difficulties are at the root of reading problems, a view also shared by Naidoo (1972). Doehring (1976) found a high correlation between reading difficulties and performances on visual tasks that require some form of sequential processing. Doehring does not suggest that sequencing difficulties are fundamental to reading problems, but he does suggest that there may be a subset of reading problems associated with sequencing difficulties. Bakker (1972) suggests that dyslexics have a basic language problem which is most apparent

in the perception of serial order - especially in temporal order and the sequencing of letters, digits and colours. However, Vellutino (1979b), while accepting that there are clear disparities between poor readers and good readers on serial sequential tasks, does not believe that sequential recall, and individual item recall, constitute separate processes. He suggests that a variety of cognitive functions may be used to store and retrieve both content and sequence. He also questions the assumption that word decoding would always entail the serial left to right processing of individual letters in a word. Kinsbourne (1970) suggests that the difficulties experienced by reading disabled children on sequential tasks are related to selective attention problems rather than sequential memory problems.

An associated aspect of these skills is that of stimulus orientation and general spatial abilities. Pollock and Waller (1978) found that dyslexic subjects have great difficulty in positioning one object in relation to another. Frith (1971) reported that dyslexics acquire orientation preferences much more slowly than normal readers, but that this ability improves with age and prolonged exposure to reading. Stanley (1975) suggests that such orientation difficulties as described, are due to problems associated with the recognition of the orientation of presented stimuli by the match with information stored in LTM.

10.5 INFORMATION PROCESSING AND LEARNING DIFFICULTIES - A SUMMARY

As was pointed out at the beginning of this section, there is a limit to the extent to which a topic as vast and varied as information processing models, can be dealt with in an overall context like this review. Consequently, the review focussed on aspects of the information processing model which gave a general overview of the issues arising in the area of reading difficulties.

There must inevitably be some debate as to the contribution that the model makes to the understanding of reading difficulties in a practical sense. Tansley and Pankhurst (1981) suggest that the model is of little value when considering remediation strategies, a view shared by Marcel (1978). Miles and Ellis (1980) are somewhat more equivocal in the matter. While agreeing that much of the successful work done with learning disabled children is due in no small way to the work of gifted teachers, who have no knowledge of information processing models, they still feel that research within this area may yet yield long term beneficial results of direct applicability. In principle, one has to concede that potentially practical strategies may emerge from some of the work in the information processing field. It has been suggested, for example, that mentally retarded subjects perform poorly on tasks involving STM, because they do not spontaneously rehearse the material they are asked to remember. Thus, possible remediation strategies may well focus on the teaching of rehearsal strategies - thus giving an example of the possible using of information processing modelling.

Farnham-Diggory (1978) is somewhat more optimistic. She feels that some direct technological solutions to help reading disabled children may well flow from the work being undertaken in the information processing area. She cites protocols as an example, where the experimenter would sample, in a detailed step by step manner, what the individual has actually been doing in the course of reading. It does, however, have to be pointed out that such processes as reading are notoriously difficult to analyse via a 'thinking aloud' procedure.

10.6 INFORMATION PROCESSING MODEL - A MULTIMODAL APPROACH TO THE LITERATURE

As has been seen, information processing concerns itself centrally with the essence of the cognitive processes which go on in the human brain, and as such is firmly aligned to the 'C' modality in all aspects, although - especially at the pattern recognition stage - the notion of sensory processes is present, suggesting elements in the 'S' modality. Finally, it has to be pointed out that all brain processes are intimately associated with the human physiological substrata - 'B' modality.

11. BEHAVIOURAL APPROACHES TO LEARNING DIFFICULTIES

11.1 INTRODUCTION

While experimental psychologists tend to focus their attention on trying to understand the implicit processes that may be involved in reading and related tasks, behavioural psychologists place more emphasis on the overt and observable manifestation of the difficulties, in part relating to the pragmatic view that one can, in theory, deal with that which is observable and potentially amenable to measured change. We can consider now some of the research on learning difficulties which adopts this approach.

11.2 ATTENTION SPAN

One of the commonest descriptions presented by teachers of children with learning difficulties, relates to their apparent inability to attend to a given task. Children exhibiting limited attention span are more likely to present as distractible, and to subsequently engage in disruptive behaviours within the classroom setting. It is, of course, important to point out that attention itself is an inferred construct, and for which there are no absolute criteria. One teacher's inattention may be another teacher's creativity! However, regardless of measures of attention used, there appears to be a consistent positive correlation between attention and achievement, as suggested by such writers as Cobb (1972), Lahaderne (1968) and McKinney, Mason, Perkerson and Clifford (1975), for example.

Hallahan and Reeve (1980) found that learning disabled children have problems attending in both the visual and the auditory fields.

Bryan (1974) and Bryan and Wheeler (1972) both report that in observational studies, children with learning difficulties are observed as having much higher rates of "off task" behaviour, within the classroom. Loper, Lloyd and Kauffman (1981) report that learning disabled children are rated as being significantly more inattentive than their peers who have no such learning problems.

Levine (1976) sees the problem in physiological terms, suggesting that normal readers exhibit a regulatory mechanism which controls the physiological variables of attention, which in turn produces an optimal level within the individual for efficient cognitive processing, although it is unclear what the nature of this regulatory mechanism might be.

Sroufe, Sonies, West and Wright (1973) demonstrated a relationship between certain aspects of attention span and learning difficulties. They also showed that when the learning disabled child was placed on an appropriate drug regime, the child's ability to attend to the task in hand improved considerably, providing some supportive evidence that the difficulty may have its genesis in biological processes. Dykman et al (1970) also provided some support for a physiological hypothesis, by suggesting that on some occasions deficiencies in attention span can be shown to be organically based.

Other writers take a more psychological view of the process of attention. Klees and Leburn (1972) report that dyslexic subjects pay more attention to the concrete characteristics of objects than do matched controls, suggesting that they may have problems attending

to the more abstract characteristics of the written word. However, Bryan and Wheeler (1972) reported that children with learning difficulties spend much more time on non task orientated behaviours, and that such behaviours are independent of the material being studied - concrete or abstract. Wedell (1968) suggests that certain children with learning difficulties may have problems switching attention from the visual channel to the auditory channel and vice versa.

Some studies have considered the notion of attention from the point of view of what distracts the individual away from the task at hand - hence limiting attention span.

Tarver and Hallahan (1974) reported that children with learning difficulties were no more easily distracted by extraneous colour cues or flashing lights than matched controls, but they did seem to exhibit problems of attention on tasks which involve the embedding of relevant material in a complex background. Other studies, such as that of Van de Voort, Senf and Benton (1972), and Satz, Rardin and Ross (1971) also report deficiencies in selective attention strategies among subjects with reading difficulties.

Some researchers suggest that attentional factors may be developmental in nature, and as such may vary as the child progresses towards maturity. Rourke (1974) reports that attention span problems with learning disabled children are more acute when they are younger, and that they tend to decrease dramatically as the child develops towards puberty, although this would be a general developmental feature of all children, and not just those with learning difficulties. Douglas (1972) in studies of hyperactive children, shows that hyperactive behaviour

becomes much less disruptive as children get older, and they engage in more directive behaviours. In this instance, hyperactivity is seen as being intimately related to attention span. Rourke, Orr and Ridgley (1974) found a correlation between attention and reading ability for young retarded readers, but the correlation was not significant for older retarded readers, giving some support to the developmental hypothesis of attention.

Hallahan and Reeve (1980) carried out an extensive investigation of attentional characteristics in learning disabled children. They conclude, in general, that:

1. Learning disabled children tend to exhibit a two to three year developmental lag in selective attention, compared with their peers.
2. Learning disabled children do not spontaneously employ efficient strategies that would enable them to perform more competently. This is most noticeable in their inability to employ such strategies as verbal rehearsal and checking.
3. When learning disabled children are taught verbal rehearsal strategies, their attention increases close to that of their peers. Thus, the suggestion is made that, when specific instruction is given which will enhance the subject's ability to attend, the attention span improves.
4. Hallahan and Reeve (1980) also report that the teaching of a verbal rehearsal strategy is more efficient at improving attention to task, than is the case where the child is rewarded with appropriate reinforcers for correct performance.

Hallahan and Reeve are suggesting, in effect, that poor performance with learning disabled children may be due to the ineffective use of learning strategies, which results in a lack of adherence to the task, resulting in boredom and lack of interest, which ultimately results in an observable lack of attention.

11.2.1 ATTENTION SPAN - A MULTIMODEL VIEW OF THE LITERATURE

As was suggested in the review, attention is an inferred construct, and as such much of the literature focuses on overtly observable behaviours - the 'Be' modality. However, as studies such as that by Levine (1976) show, there are physiological variables of attention, being suggestive of the 'B' modality. Also the studies cited in which drug regimes are used to control attentive behaviour, are also relevant to the 'B' modality. Also, some of the studies, notably those by Hallahan and Reeve (1980), which focus on the child's attentive behaviour within the classroom setting, must take account of interpersonal processes - particularly between the child and the teacher - and thus have elements of the 'Ip' modality. The suggestion also raised in these studies that the lack of attention in learning disabled children is related to boredom, must bring in elements of the 'A' modality. Finally, "on task" behaviour in the classroom setting also implies that the child is working through appropriate educational tasks - further suggesting a cognitive component in play - 'C' modality.

11.3 BEHAVIOURAL ASPECTS OF MEMORY

Some researchers such as Torgesen (1977) suggest that the evidence reporting that children with learning difficulties have a poor memory

span, may be a direct result of the inappropriate use of learning strategies on their part. Torgesen reports results which showed that when normal readers were given a sorting task with pictures, they made use of categories which subsequently resulted in an increased ability to recall the pictures accurately. Learning disabled children, on the other hand, performed much less well on this task, and it was observed that they adopted less efficient sorting strategies, which Torgesen suggests resulted in retention and subsequent recall being impaired. Studies by Bauer (1977, 1979) support Torgesen's view.

However, further studies have suggested that these conclusions may not apply to all children with learning difficulties. Torgesen and Houck (1980) considered the performance of learning disabled children on the digit span sub-test of the WISC. Some of the learning disabled children performed in the retarded range on this sub-test, while others performed within the normal range. The results suggested that the learning disabled children who had difficulties with the digit span test, would not have their memory functioning enhanced, by being taught more efficient strategies. Torgesen and Houck suggest that these results merely serve to emphasise the very heterogeneous nature of the group of children considered as having learning disabilities. Thus, within the population of learning disabled children there will always be subsets who do not respond to behavioural intervention programmes and strategies, which may appear effective with other groups.

11.3.1 BEHAVIOURAL ASPECTS OF MEMORY - A MULTIMODAL VIEW OF THE LITERATURE

Although the focus of Torgesen's studies is on the behavioural manifestations which can be used to infer memory difficulties - 'Be' modality, the majority of the studies cited refer to cognitive skills - 'C' modality, and teaching strategies, which again will inevitably involve the 'Ip' modality.

11.4 METACOGNITION AND LEARNING DIFFICULTIES

Some researchers who have considered the result of studies which apparently show that learning disabled children do not employ efficient strategies when approaching reading tasks, have suggested that the deficiency lies in a more general lack of awareness of when, and in what way, to employ such strategies. Whereas the actual use of a strategy may be construed as the behavioural manifestation of a cognitive process, this awareness of strategy utility is described as a metacognitive process, in that it involves a higher level of functioning. Flavell (1979) suggests that a full understanding of the performance of children on tasks in the learning field requires not only the consideration of cognitive processes, but also the consideration and awareness of the operation of metacognitive processes as well. Cognitive processes and strategies would be used to make constructive progress through a task, whereas metacognitive strategies would monitor the progress through the task.

There is some evidence that children with learning difficulties may well be less competent at monitoring their own reading performance,

than is the case with children who do not have such difficulties. Smiley, Oakley, Worthen, Campione and Brown (1977) demonstrated that for good readers the recall of information from a prose text was, in part, a function of the degree of importance of the information to the overall flow and meaning of the text. With disabled readers, there was not this distinction. It is suggested that the good readers employ metacognitive strategies, which enable them to make judgements about the relative importance of sections of the text, whereas with the disabled reader this ability is not apparent. Forrest and Waller (1981) support this general notion, when they demonstrated that poor readers exhibited significantly less ability to extract relevant information from a passage of text. Owings, Petersen, Bransford, Morris and Stein (1980) also showed that learning disabled children exhibit less efficient metacognitive strategies when setting out to study for formal examinations.

There does appear to be a growing body of evidence which is interpreted as suggesting that learning disabled children are significantly more likely to fail to employ active metacognitive strategies in order to facilitate their learning. Thus, the inability to have an awareness of the usefulness of such strategies, may in itself undermine the efficiency of such strategies. This metacognitive deficiency may well result in inefficient use of cognitive strategies due to being unable to see them, and hence monitor them, in a more general context.

11.5 INDIVIDUAL CONTROL VARIABLES AND LEARNING DIFFICULTIES

11.5.1 INTRODUCTION

Some research has addressed itself to the extent to which - in the case of learning disabled children - their beliefs about their own personal control over events in their lives has a direct bearing on the presenting problem. Whereas metacognitive issues focus on the child's awareness of strategies, the issue of personal control takes a broader view in considering the child's perception of his or her own role in events.

11.5.2 LOCUS OF CONTROL STUDIES

Locus of control focuses on how an individual perceives their own status in relationship to events in their environment. An individual with an internal locus of control would see themselves as broadly in control of the events in their environment, whereas those presenting with an external locus of control would see external events as determiners of their own situation. Generally speaking, studies, such as that by Stipek and Weisz (1981) show that high achievers demonstrate a strong internal locus of control, and that they believe in themselves and their own abilities.

Several studies, such as those by Chapman and Boersma (1979), and Fincham and Barling (1978), have shown that learning disabled subjects present with external locus of control profiles. However, other studies by Adams(1977), and Canino (1980), have shown no difference in measures of locus of control between disabled and non-disabled readers. Harter (1980) and Weiner (1977) suggest that this somewhat

equivocal picture may be the result of the fact that locus of control may be too insensitive a measure to adequately discriminate between the various factors that are relevant with learning disabled children.

11.5.3 LEARNED HELPLESSNESS STUDIES

Learned helplessness is somewhat related to locus of control, inasmuch as it refers to an individual's belief that they have no control over the outcome of events in their life, which consequently results in a failure to understand any relationship that may exist between constructive effort and subsequent success.

Pearl et al (1980) suggest that learning disabled children are characterised by a tendency towards learned helplessness. The studies suggest that across various situations, learning disabled children are less likely to believe that any failure was as a result of lack of effort on their part, whereas failure with non learning disabled children will often be seen in terms that reflect the effort of the individual concerned.

11.5.4 INDIVIDUAL CONTROL VARIABLES - A MULTIMODAL VIEW OF THE LITERATURE

Individual control studies - whether focussing on locus of control, or on learned helplessness - tend to reflect issues of attitude and belief on the part of the individual. Largely speaking these will reflect thought processes - 'C' modality, although the role of imagery - the creation of a mental picture of oneself in a given context - may be relevant here - 'I' modality. Again, the inference flows from overt behaviours - 'Be' modality, and the teaching of appropriate strategies may well require interpersonal processes - 'Ip' modality.

11.6 COGNITIVE STYLE AND LEARNING DIFFICULTIES

11.6.1 INTRODUCTION

Cognitive style is viewed as a relatively fixed feature in an individual's functioning, which often characterises the manner in which an individual will approach a given task - perhaps somewhat analogous to a personality trait. Cognitive style accounts try to consider individual differences between subjects, and as Edwards (1968) points out, this should be a central feature when considering any learning disabled child, and the subsequent intervention that they may require.

11.6.2 THE RESEARCH

Stott (1971, 1978), suggests that poor reading performance is not readily explainable by a deficit model which seeks to identify where mechanisms are going wrong. He prefers to consider the difficulties in terms of inappropriate use of the child's own strategies. Newton et al (1979) consider that dyslexic subjects appear to have a predisposition towards spatial thinking combined with a poor performance on tasks such as sequencing, sound blending and sound association. The suggestion is that this approximates to a learning or cognitive style, which is incompatible with the heavy emphasis on written language. Hence, it is hypothesised, subjects with such a learning style are more prone to having reading and related difficulties. Gupta, Ceci and Slater (1978), when looking at the performance of good and poor readers on tasks of visual discrimination, believed that the differences between the groups could be ascribed to differences in linguistic strategies, and hence learning or

cognitive style, and not to problems of visual discrimination.

A well documented cognitive style is that of field independence - described by Witkin et al (1962). Friedman, Guyer-Christie and Tymchuk (1976) postulate a relationship between field dependence and learning difficulties. They report that field dependent subjects have incomplete left hemispheric dominance, and that learning disabled subjects in many instances show incomplete hemispheric dominance, leading to the suggestion that there is a link between field dependence and learning difficulties.

Van Meel, Vlek and Bruijel (1970) hypothesise that children with learning difficulties may have a particular cognitive style which they describe as "foreshortening of temporal perspective". This, they define, as a propensity for using cognitive functions that in any situation would tend to complete the task in the shortest possible time. Subjects behaving in this manner will exhibit a style which may well be detrimental to other aspects of task completion - such as relevance of context, precision, neatness and overall structure. This they see as generally characteristic of the child with learning difficulties. It should also be pointed out that this "style" appears to be similar to what Shapiro (1965) described as a "neurotic style", and also seems similar to the Impulsive-Reflective style described by Kagan, Pearson and Welsh (1966).

Meichenbaum (1976) adopts a cognitive style approach to looking at learning difficulties. He is unhappy with the normative / comparative approach to learning difficulties, which seeks to place a child in relation to a population of peers as a whole. He is also unhappy

with the commonly held deficit model of learning difficulties, which focuses on the areas where things are going wrong. Meichenbaum suggests that the problems may be more constructively addressed by considering the individual cognitive requirements that a given task might have, and on which the learning disabled child is seen as failing. If inappropriate cognitive strategies are identified, then this provides a potential route on which to build remedial approaches.

11.6.3 COGNITIVE STYLE - A MULTIMODAL APPROACH TO THE LITERATURE

Cognitive style clearly relates to the characteristic cognitive processes which any individual adopts - 'C' modality, and which are inferred through behavioural observation - 'Be' modality. Shapiro (1965), with the "neurotic style", also suggests an emotional component in some instances - 'A' modality.

12. EMOTIONAL VARIABLES AND LEARNING DISABILITIES

12.1 INTRODUCTION

A basic skill such as reading, which is clearly so central to all aspects of an individual's functioning within society in general, can obviously carry an inordinate emotional loading. It can be argued that the inability to read properly would seriously inhibit an individual's ability to function across a whole range of activities, and consequently the subsequent psychological and sociological ramifications would be seen as having emotional overtones.

12.2 THE RESEARCH

Ohlson (1978) carried out a review of literature in this area, and reports on balance the evidence suggests that reading disabled children tend to suffer more prevalently from a variety of emotional difficulties. Similarly, Vernon (1971) showed that poor readers demonstrated more evidence of maladjustment than did good readers. Goldberg and Schiffman (1972), and Cox (1970) believe that emotional difficulties are fundamentally endemic in all forms of reading and learning disabilities. Where most researchers were content to talk about emotional difficulties in general terms, some are more specific in their descriptions. Abrams (1970) suggested that there is a specific neurotic component in children with reading disabilities, whereas Merritt (1972) goes as far as to label such children as suffering from reading neurosis.

An interesting study by Rosenthal (1973) demonstrated that dyslexic children had much lower levels of self esteem than both normal controls and control subjects who suffered from asthma. It was also found that

when specific information was made available to the families about learning disabilities, then this reduced the magnitude of the problem in psychological terms, and increased the child's self esteem. This evidence seems to suggest that whereas children who suffer from a condition like asthma, which is clearly diagnosable and subsequently treatable in a relatively straight forward and uniform fashion, suffer less problems of self esteem, than is the case of children whose problems seem to be more defuse and difficult to pin down, as is the case with dyslexic subjects. It is also interesting to note the importance of making information available in order to reduce anxiety and subsequently to help the child's general emotional adjustment.

Some writers take a more overtly medical view, and suggest that dyslexia can be looked upon as a form of psychological defence, in some ways similar to that which would be demonstrated in a conversion hysteria. Manzo (1977), takes this much more psycho-dynamic view, and sees the reading disability as an overt expression of some deep seated underlying anxiety. Ravenette (1979), suggests that the dyslexic subjects may have emotional problems such that they do not want to learn to read for a variety of unspecified and determined reasons.

Silverman, Fite and Mosher (1959), and Valtin (1972, 1973) both report that emotional problems are more likely to occur in disabled rather than in normal readers. This manifests itself as generally elevated anxiety levels, and in some instances evidence of depression.

The Bullock Report (1975) draws much of this evidence together, and concludes that disabled male readers are twice as likely to suffer anxiety problems and three times as likely to suffer from irrational

fears, than is the case with non-retarded readers. Some writers clearly see the genesis of emotional problems of disabled readers as lying in relationships with, and attitudes of, the child's parents. Vernon (1971) suggests that any emotional problems evidenced in children with learning disabilities to a large extent reflect emotional difficulties of the parents. Ravenette (1968) suggests that many forms of reading disability can result from over ambitious parents who inadvertently create unbearable pressures on the child, who is subsequently unable to cope with the possibility of failure even at a relatively minor level. Kellmer-Pringle (1965) also points to the importance of parental factors, in reporting that parental deprivation - most especially partial or even complete separation in early childhood from the child - is associated with emotional maladjustment and subsequent reading difficulties.

12.3 EMOTIONAL DIFFICULTIES - A SUMMARY

It is clearly impossible to establish any direct causative link between emotional problems and reading difficulties, although it seems clear that there is a correlation between the two. Tansley and Pankhurst (1981) believe that a generally useful rule of thumb approach to this area would be to suggest that emotional difficulties arise because of feelings of frustration and anxiety which are associated with problems in learning to read.

12.4 EMOTIONAL VARIABLES - A MULTIMODAL VIEW OF THE LITERATURE

Any focus on emotional variables inevitably is strongly associated with the subject's general affective state, and so clearly relates to the

'A' modality. Issues such as self esteem which arises in this context (e.g.: Rosenthal 1973) bring in elements of both the 'C' modality - what the subject thinks of himself, and the 'I' modality - the image the subject holds of himself. Manzo's psychodynamic view, will involve elements of 'C' modality, 'I' modality and 'Be' modality. Many of the studies infer emotional disturbance from overt maladaptive behaviours - 'Be' modality (e.g.: Vernon 1971), and the importance of interpersonal relationships - especially with parents - is also emphasised by Vernon (1971) and Ravenette (1979), - 'Ip' modality.

As Lazarus (1981) points out, the manifestation of emotional difficulties may be a highly idiosyncratic thing, and may involve complex interactions across the modalities of the BASIC-ID. Consequently, it is not surprising to find many of the modalities touched upon when considering learning difficulties from an emotional perspective.

13. ENVIRONMENTAL INFLUENCES AND LEARNING DISABILITIES

13.1 INTRODUCTION

The other pole of the nature - nurture debate, which has not as yet been addressed, is the line of thought which suggests that the most influential variables in a child's learning to read or failure to learn to read, lie in the environment and the social milieu in which the child lives.

13.2 THE RESEARCH

Writers such as Crabtree (1976) and Stott (1978) would see dyslexia and its related disabilities as being largely a function of environmental factors, such as inappropriate teaching styles on the one hand, and faulty learning strategies on the other. At a more general environmental level, Vernon (1971) feels that reading difficulties are most often associated with the child's social background. She feels that poor and deprived social conditions may lead to such problems as low motivation, emotional disturbance and negative attitudes, which in themselves can be direct triggers of reading and learning difficulties, because the child may find it impossible to relate to a traditional learning environment, and may well be motivated to behave in a directly antagonistic way towards formal learning. Eisenberg (1966) reports some evidence for such a view, when he finds that reading retardation rates were much higher in ordinary schools within a metropolitan area where socio-economic status was extremely low, and conversely, that reading retardation

was much lower in independent schools where socio-economic status was much higher. In a survey of reading disabilities and social class, Kellmer-Pringle (1966) found that in social classes one and two, poor readers accounted for 7.1% of the population. In social class three, poor readers accounted for approximately 19% of the population, whereas in social classes four and five, poor readers would account for anything up to 27% of the population. In reviewing much of the evidence in this area, Vernon (1971) is led to the conclusion that reading retardation and low social status are generally related, and that such a correlation can be seen as quite independent of I.Q. More recently, Pumfrey and Naylor (1978) highlighted the importance of social deprivation on subsequent reading achievement, most especially in socially and economically deprived urban conurbations. Related to this to some extent, would be the findings of Harris (1976) which showed a clear relationship between adverse sociological factors and reading disabilities within the children of immigrant populations.

As well as these more global and endemic social problems, Goldberg and Schiffman (1972) point to the importance of specific environmental and social crises and their relationship with subsequent learning. For example, they cite instances such as death within the family, serious illness within the family, parental separation or divorce, as being examples of typical crises which may precipitate a marked deterioration in a child's ability to learn.

Wright (1974) pointed to the importance of maternal attitudes to the home and general social environment, as being a significant factor in

a child's reading readiness, and subsequent early learning performance once they begin to attend school. This along with other factors may well be enough to set the child off on a path of early failure and subsequent learning disabilities. Yule and Rutter (1976) point to the importance of family size, when they report that reading disabilities are far commoner in children from large families, than is the case with children from smaller families. Owen et al (1971) emphasised how environmental factors can create a vicious circle, when they reported that parents of children with learning disabilities perceive their children as more anxious and difficult to manage, and subsequently tended to reinforce the child's negative attitudes about schooling.

Motivation is also a factor which is clearly influenced by family and general social variables. Wedell (1977) and Ackerman (1974) both report low motivation to be associated with learning disabilities, and as such, it would be expected that such disabilities would be of greater frequency in backgrounds where motivation was low. The converse of this was the finding by Zimmerman and Allebrand (1965) who found that reading achievement was significantly improved if the child had a strong motivation to work towards improvement.

The school environment is also seen as an important variable in considering learning disabilities. Beez (1968) showed that teacher expectation was an important factor with children with learning disabilities. Even more importantly, Hart and Fagg (1976) and Goodacre (1968) demonstrated that teacher expectations, while being

important, are not necessarily accurate when it comes to identifying children with learning disabilities. Vernon (1971) demonstrated that reading achievement in children is directly related to the skills of the teacher, and that consequently inexperienced and poor teachers, are more likely to have children with learning disabilities in their classes.

In a cross cultural study, Thorndike (1973) looked at reading in fifteen different countries. Not surprisingly, Thorndike found that reading levels in three of the developing countries where there was less sophisticated schooling and teaching practice, were significantly inferior to that in developed countries. Thorndike concluded that school environment and teaching skill is therefore demonstrably a significant factor in reading achievement. Vellutino (1979b) also lends support to the notion that direct experience within the school is of fundamental importance when looking at learning disabilities. Vellutino and Connolly(1971) have demonstrated that for even the most disadvantaged child, where learning disabilities are more likely to be noticed, there is evidence to suppose that many of these difficulties can be remediated by individual tuition.

Some writers are less sure about the relationship between environmental factors and learning disabilities. Klasen (1972) and Naidoo (1972) both reported no correlation between dyslexia and socio economic and cultural factors. This is taken to support the notion that environmental variables may not be of great importance in considering learning problems.

13.3 ENVIRONMENTAL FACTOR - A SUMMARY

While it seems clear from the literature that environmental and social factors are, in many instances, associated with learning disabilities and poor reading, it has to be said that there are many children with highly disadvantageous social backgrounds, who nonetheless have no problems with learning to read. At best it can be said that environmental variables can have a major contributory effect in the whole area of learning disabilities, although the nature of that effect will vary depending on the specifics of the environment and individual characteristics of the child. Clearly, consideration of home situations, local community situations, and also of the learning environment within the school, are very important in a rounded assessment of a child's learning disabilities.

13.4 ENVIRONMENTAL INFLUENCES - A MULTIMODAL VIEW OF THE LITERATURE

Consideration of environmental factors associated with learning difficulties always involves placing the child in a particular context, be it at home, at school, or in the community in general. In any of these situations, the importance of interaction and relationships with other individuals is clearly a major factor - the 'Ip' modality. As is pointed out, environmental factors can influence attitudes - 'C' modality and 'I' modality - which will lead to behavioural patterns which may be incompatible with successful learning - 'Be' modality. Studies on social deprivation

also touch upon general health issues - 'B' modality, and at all times difficult environmental features which may influence a child's learning patterns are likely to result in emotional upset - 'A' modality.

14. INTERVENTION AND REMEDIATION WITH LEARNING DIFFICULTIES

14.1 INTRODUCTION

Having considered in some detail the research regarding potential aetiological factors in learning difficulties, it is appropriate to look at the attempts that have been made to help children who present with such problems.

Teachers and other professionals dealing, on the ground, with children with learning difficulties will accept that research is a necessary process in the overall search for the most appropriate way to help such children, and they are particularly encouraged when it becomes apparent that research findings will lead on to appropriate and useful intervention and remediation strategies.

14.2 ASSESSMENT

It is almost a truism to say - as does Lazarus (1976) - that an adequate assessment is a sine qua non for an effective subsequent intervention. At all times an assessment should be both functional - identifying the features that are inhibiting the learning - and prescriptive - suggesting interventions to facilitate learning. Carroll (1972) believes that an assessment should refine the view of the problem to identify classifiable groups of difficulties, whereas Cave and Maddison (1978) emphasise the need for an assessment that will focus on the individual needs of the child, a point also emphasised by Champion (1979). Lerner (1976) sees assessment as an on-going and self reflective process, progressing logically from diagnosis to planning, to implimentation, to evaluation of the subject's performance, and finally to any necessary modification of

the original diagnosis, which then becomes the starting point again for the whole process.

In general, the literature tends to veer away from a simple, straightforward normative assessment approach, towards a more individualized task analysis and prescriptive approach.

14.3 EFFECTIVENESS OF INTERVENTION STRATEGIES - SOME GENERAL ISSUES

Chazan (1967), in a review of earlier studies, demonstrated that remedial approaches seemed to show substantial short term gains, but that in the longer term there appeared to be no significant differences between subjects who received remedial support, and those that did not. Carroll (1972) was slightly more optimistic. He reported that remedial support improved general social adjustment and attitude to reading, as well as producing educational gains which were more than would be expected if no help were given.

An earlier study by Collins (1961) lends some support to Chazan's view. In this study, children with specific reading problems attended a remedial unit for two weekly sessions over a 6 month period - (72 hours in all). Significant gains were reported for this treatment group compared with matched controls - especially in word attack skills - but the differences in the long term were not significant. Collins suggests that this supports the view that the benefits of remedial help are not permanent. Lytton (1967) qualified this view, by reporting that some children - especially ones of higher ability - maintained gains achieved during remedial intervention.

However, as early as the 1950's Curr and Gourley (1953) pointed out

potential sources of error and difficulty in trying to assess the effectiveness of intervention. Most notably, they point to practice effects on post-intervention test scores, improvements due to familiarity with materials used during the remedial teaching, and the effects of regression - a point later emphasised by Yule and Rutter (1976). Cashdan et al (1971) point out that evaluation involves more than merely reporting mean gains in any group of subjects. It is also necessary to take account of individual variations in performances.

Vernon (1971) found that the degree of improvement depends on the age of the children, most especially that older children appear to make smaller gains, and those that are made are made less readily. Cotterell (1970) & Naidoo (1970) also show that younger children make much better progress than older children, as a result of remedial programmes.

Richardson and Brown (1978) also considered the usefulness of involving parents in the remedial process. They identified children who were retarded in reading for a variety of reasons, and divided them randomly into three groups:

- withdrawal for 40 minutes per day in remedial centre.
- parental educational counselling on how to help children.
- combined withdrawal and parental counselling groups.

The results showed that all groups gained in reading, with no significant differences between the groups. However, they did point out that there was a particular subset of subjects with quite specific reading difficulties, that appeared not to benefit in any of the 3 conditions.

A study by Topping (1977) also showed that when children with difficulties were withdrawn to a remedial unit, slow learners progressed well, but children with more specific difficulties did not respond so well. However, surprisingly, Topping reports that the children with more specific difficulties actually increased their rate of progress when they transferred back fully into schools. Gottesman (1978) also reports that children dealt with in ordinary school made better progress than those dealt with in special units.

Hornsby and Miles (1979) again emphasise the necessity of focussing on individual differences in subjects, and warns against making assumptions of homogeneity. Clay (1979) pointed out that to take full account of individual differences, it would be necessary to take on board qualitative data as well as psychometric data. Elkins (1978) suggests that the generally equivocal results emanating from research studies, were a function of the lack of time and effort taken to identify individualised profiles.

It would seem appropriate at this general point, to introduce the issue of the Hawthorne Effect. Regardless of the intervention proposed, the fact that measured change in any subject population may be due to a Hawthorne Effect has to be taken seriously. Chall (1967) in a review of teaching methods, reported that teachers often were committed to a particular method, and the emotional investment stemming from this was liable to lead to novelty and change, which in itself may have a beneficial effect on the children exposed to the approach. Parsons (1974) argues that a Hawthorne Effect is inherent in whatever strategy is developed for the child with learning difficulties, because it always involves making apparently novel and specific

commitments to the child. Gredler (1977) also emphasises that it is impossible to discount the effect that highly motivated and empathic adults will have on the development of the child's learning abilities.

Finally, it may be hypothesised that when children are exposed to a variety of novel - to them - approaches, the researcher may be justified in assuming that any Hawthorne Effect is constant across approaches.

Footnote:

It is worth emphasising that when approaches are being considered, "individualised" approaches refer to the development of a programme for the individual child, and not to 1 : 1 teaching exclusively. Indeed, Stott (1978) argues that constant 1 : 1 teaching may be too threatening for the child, and hence counterproductive.

14.4 SOME SPECIFIC STRATEGIES

Having considered some general issues regarding intervention and remediation, it would be appropriate to consider some specific approaches in more detail.

14.4.1 NORMAL TEACHING METHODS

Writers such as Clay (1980, 1982) argue that the most effective method of determining whether a child can read, is to teach him to read. Taking a lead from such a pragmatic view, many remediation schemes are based on sound, practical ideas and techniques, which are used as a matter of course with infants. Typical of such approaches are schemes based on extension of phonic teaching, and multisensory approaches. Shedd (1969) reported successful outcomes with reading disabled children using a multisensory approach, and very structured materials. A study by Wilson, Harris and Harris (1976) which involved a combination of phonic and multisensory approaches, reported significant gains in reading for children with learning difficulties.

Whittaker (1982) in reviewing remediation practices with children who had learning difficulties, argued that most remedial teachers work methodically, using the materials in commercially produced reading schemes, which often contain excellent phonic approaches to reading, and score successes in doing so. Hornsby and Miles (1980) emphasise this systematic structured approach, arguing that if the teacher builds on the strengths of the dyslexic child, in a traditional teaching context, then this can be very effective, in certain cases.

14.4.2 BEHAVIOURAL METHODS

Behavioural approaches to remediation conceptualize the nature of the learning difficulty in terms of the teaching methodology, and the extent to which the child's performance is practised or rewarded, as opposed to approaches which see the problem as "in child", and as such, suitable for "treatment".

Ainscow and Tweddle (1979) report that a task analysis, and the setting-of-objectives approach, can be of great help to learning disabled children. As Locke et al (1981) point out, the chances of better results are significantly enhanced if the subject clearly knows what he/she is expected to achieve, and to work towards at the end of a teaching session. Thus, setting clear behavioural objectives and teaching towards them is seen as a valuable approach. Englemann and Bruner (1975) showed that a very tightly scripted programme where the children are consistently reinforced for correct responses, and where they have to consistently repeat tasks they failed on, was successful with learning disabled children. Matthews and Booth (1982) suggest the success of such approaches results from the on-going feedback available to both teacher and pupil. Paired reading programmes, where clear and precise objectives and instructions are laid out for parental involvement in helping their children, have proved popular and effective, Hewison (1981). The parents essentially model the correct responses while the child reads them aloud, and Morgan (1976) argues that this process acts as a reinforcer for the child, while Miller (1981), sees the benefits flowing from the reduction of the child's anxiety about reading, and a concurrent increase in self esteem due to the attention and praise

forthcoming from the parent. Researchers such as Gallivan (1982) and Arora and Sheppard (1983) report considerable success with paired reading programmes for learning disabled children. Interestingly, Gallivan (1982) also reports that teachers find the paired reading approach much more difficult to undertake than parents apparently do. It is suggested that the strength of this method lies in the fact that it enhances the affectionate and motivating parent-child bond, which is quite different from even a good teacher-child relationship. Wolfendale (1983) suggests that involving parents in a systematic and monitored manner in hearing their children read, produces significant gains for children with reading difficulties, without having to use the structure of the paired reading technique at all.

14.4.3 COGNITIVE PROCESSING APPROACHES

While the behavioural approaches focus on the extra-subject features of teaching strategies and reinforcements, there are a considerable number of approaches which still focus on the "in child" factors, and use the theoretical models developed to describe these processes as a starting point for remedial intervention.

Jorm (1978, 1989) argues that dyslexic children have problems in understanding the meaning of words via phonological re-coding, which Jorm sees as a STM deficit, which is a genetically based dysfunction of the brain. Jorm argues that phonic approaches are inappropriate, and argues for a more direct 'look and say' approach which relies more directly on the visual field, and not on the defective auditory field.

Many researchers tend to emphasise the problems that dyslexic subjects have in the auditory field, but different interpretations lead to different approaches. Vellutino (1977) proposes teaching subjects verbal thinking strategies to help them analyse and code visually presented material, a position supported by Valett (1980). Miles and Ellis (1980) believe the encoding difficulty for dyslexics lies in a faulty internal 'lexicon' against which incoming stimuli are matched, and they consequently argue for a phonic approach to remediation as being the most likely method of facilitating such a match and hence facilitating reading.

Russell (1982) hypothesised that, in a minority of children who present with learning difficulties, the representation of phonic sounds by individual letters may be inappropriate, and he suggests that remediation should deal with syllables as the basic building unit in reading. This hypothesis is supported by Williams (1980) who claimed that remediation programmes for dyslexics based on specific training in phoneme blending produced beneficial results.

14.4.4 PHYSIOLOGICAL APPROACHES

Some remediation approaches focus on direct attempts to intervene with biochemical process in an attempt to elicit changes in the individual which will facilitate learning.

For example, Connors (1976) and Douglas (1976) demonstrated that the use of stimulant drugs enhanced learning by improving concentration span and selective attention. Valett (1980) argues that dyslexic children suffer from biochemical and metabolic imbalances, which interfere with attention, and the processing of neural stimuli. He

argues for the use of medication in such instances to restore the biochemical balance. Frank and Levison (1976, 1977) have shown that drugs normally used to alleviate conditions like motion sickness help to improve the performance of dyslexic subjects on learning tasks, because, they suggest these drugs help combat a cerebellar-vestibular dysfunction which they see as the genesis of dyslexia. Pavlidis (1981) also reports evidence supporting this theory, but does not suggest medication as an appropriate intervention. In reviewing the available literature in this area, Oettinger (1978) suggests that some dyslexic children may benefit from appropriate medication but that for those who do, upwards of 75% may have to remain on medication throughout their lives. At best, appropriate medication may help subjects to improve their attention span, but it in no way can be viewed as a substitute for good, effective, prescriptive teaching.

Other techniques which have physiological effects on the individual, while attempting to deal with aspects of learning difficulties, are hypnosis and meditation.

Bloomfield et al (1975) demonstrated that regular transcendental meditation practice improves brain wave synchrony, slows heart rate, and improves reaction time to stressful situations, decreases blood pressure, decreases anxiety, improves auditory perceptual discrimination, and increases memory retrieval skills. Valett (1980) also reports that meditation has significantly beneficial effects on learning performance. The benefits of using hypnotic techniques have also been reported with learning disabled children. Krippner (1966) using hypnosis, reported significant gains in reading performance with

children who had learning problems. Jampolsky (1970), demonstrated the value of relaxation training under hypnosis in reducing the frequency of handwriting reversals in reading disabled children, results confirmed by Carter and Synolds (1974). Researchers who use hypnotic techniques with learning disabled children emphasise anxiety as a key factor predisposing the child to the learning problem.

14.5 REMEDIATION AND INTERVENTION - A SUMMARY

Much of the previously presented findings reflects a cross section of varying approaches to dealing with the problems of children with learning difficulties. It is fair to say that no one approach in any way offers a panacea to children who have difficulties with their reading or related skills, and the literature reports evidence of success and failure in all contexts. The most consistent point to emerge in the literature, is that, regardless of strategy or approach adopted, there is a need for the teaching to be methodical, well structured and consistent. There is clearly a need to adopt an open mind on specific approaches, and apply what appears most appropriate in any given situation.

14.6 INTERVENTION AND REMEDIATION - A MULTIMODAL VIEW OF THE LITERATURE

When one considers the whole spectrum of approaches and interventions that are undertaken with children with learning difficulties, it would seem clear that most areas of the BASIC-IB are covered quite comprehensively.

As was pointed out, successful intervention would appear to be dependent on clear prescriptive teaching programmes as the hub of any strategy. This will involve teaching cognitive skills - 'C' modality, through the medium of individual, small group or class sessions, thus involving interpersonal skills at all stages - 'Ip' modality. The importance of the Hawthorne Effect also manifests in this modality. Behavioural approaches also emphasise teaching of appropriate strategies working to behavioural objectives - involving elements of the 'Be' modality, the 'C' modality and the 'Ip' modality. The more cognitive approaches - often based on Information processing models, take in elements of the 'C' modality, and the 'S' modality. The use of medication to influence features such as attention span clearly touch on the 'B' modality. Meditational approaches affect physiological parameters - 'B' modality, reduce anxiety - 'A' modality, and influence cognitive performance - 'C' modality. Hypnotic approaches also touch upon the 'A' modality, the 'B' modality, the 'I' modality, the 'C' modality, and the 'Ip' modality - in as much as they involve interaction with a therapist.

At the end of the day, when a view is taken across the spectrum of interventions, then all the elements of the BASIC-ĪB are involved to a greater or lesser extent, depending on the direction one chooses to go in.

15. Recent Research - Findings and Implications.

15.1 Introduction.

Within the whole area of children with learning difficulties, there has been a significant shift in emphasis following on from the recommendations of the Warnock Committee, (DES, 1978). The main thrust of these recommendations has been enshrined in the 1980 Education Act, and the 1981 Education (Scotland) Act, and practice within schools has begun to change in response to this. Consequently, there has been considerable interest in the extent to which the implementation of these Acts has affected the provision for children with special educational needs within mainstream schooling. Since children with specific learning difficulties obviously fall into this category, it will be useful to consider the main aspects of the Warnock recommendations, and to note the direction in which research in the area of learning difficulties has been going.

15.2 Summary of Warnock Recommendations.

In this instance, I will restrict comments to those recommendations which clearly have a bearing on the area of learning difficulties in the mainstream school. Warnock points out that up to one in five children at some time in their school career will require some form of special educational help (paragraph 3.17). This clearly places a considerable onus on ordinary schools to be sensitive to, and aware of, the needs of such children, and to plan support for them within the context of mainstream schooling. Within the area of specific learning difficulties, it would be

expected that the vast majority will require to be dealt with within the school, and Warnock has some specific recommendations to make in this respect. The need for discussion and forward planning on the part of the staff is emphasised, (paragraph 7.21), and it is suggested, the thrust of special support systems should be centred firmly within the school, with appropriate resources being made available in the school, as necessary, (paragraph 7.35, and paragraph 7.36).

In section 12 of the report the committee place emphasis on the importance of appropriate training - both pre-service and post-service - for teachers and related professionals, since they will have to implement any recommended support strategies for children with special needs.

In essence, the points outlined stem from the more general philosophical emphasis underpinning the report, namely that as far as is possible, special educational needs should be catered for within ordinary schools, and in the case of children with specific learning difficulties, this will virtually involve one hundred percent of the population in question.

15.3 Post-Warnock Research.

Studies by Gipps, Gross & Goldstein (1987), and by Croll & Moses (1985), have considered practice within mainstream schooling with children with learning difficulties. It may be useful to consider some of the outcomes of their studies.

15.4 Beliefs about Origins of Learning Difficulties.

In a study of teachers' attitudes and practices within schools, Croll & Moses (1985) report that the most commonly identified learning difficulty is still associated with reading. They report that, almost without exception, teachers view the difficulties that pupils have as arising from innate factors within the child, from contributory factors within the home, or from some combination of the two. Innate - "in-child" - factors are the most popular view, with home factors usually being seen as a secondary influence. It was consistently unusual for teachers to view children's difficulties as arising from factors which could somehow be construed as being within the control of the school, or of the teachers themselves.

Thus, while the emphasis from the Warnock report was to see the child in context - be it at home, school or wherever - and to consider needs accordingly, the attitudes displayed by teachers towards the child with learning difficulties would generally not seem to accommodate this shift in emphasis.

15.5 Methods of Assessment.

Croll and Moses (1985) report that the forms of assessments used by teachers were generally standardised tests in reading and related skills. Such assessment devices tend to reinforce the "in child" perception of the problem rather than focussing on a profile of the individual child's strengths and weakness which reflects both innate factors and the more dynamic inter-actional factors which are a function of the child in the context of both the school and the community. Croll and Moses point out that the assessment of children's difficulties can only be seen

as being of value if appropriate remedial intervention follows on, and they make a plea for assessment approaches which develop in a sequential and directive fashion. Thus, teachers will require to be more aware of criterion based assessment and approaches which encourage realistic objective setting, rather than the sterile approach of norm referenced reading ages and the like. Thus, the necessity for appropriate in-service training is emphasised in order to give teachers the appropriate skills to bring into the school setting.

15.6 Methods of Intervention.

Gipps, Gross and Goldstein (1987) found that there would appear to be no consensus amongst teachers as to the most appropriate way in which to provide help for children who have learning difficulties.

Croll and Moses (1985) found evidence of both in-class support for children with learning difficulties, and of support based on a system of withdrawal from regular classroom activity. Such withdrawal support included both one to one interaction, and small group activity sessions.

They generally found teachers in favour of withdrawal from regular classroom activity as a means of supporting such children, although many of the assessment criteria used to select children for withdrawal support were at times considered by some respondents to be dubious. At the same time, teachers appeared to be rather pessimistic about the benefits of special support - withdrawal or otherwise - for children with learning difficulties, and they

generally predicted that the majority of such children would not benefit from such support to any great extent. As far as withdrawal is concerned, there was general agreement that children benefited from an arrangement such as this since it would provide a context in which they would become more self confident and secure, although teachers perceived this as very much a secondary result of a process designed to tackle the actual learning difficulty. While only a small percentage of teachers felt that the disadvantages of withdrawal in any way outweighed the advantages, certain disadvantages such as disruption of the child's general educational programme, and the potential stigmatising effect of withdrawal were mentioned.

As Croll and Moses observe, teachers appear to adopt a somewhat paradoxical stance on this issue; they endorse support and withdrawal in particular - something has to be offered, but they seem somewhat pessimistic about the benefits as they pertain to the presenting learning difficulty. This somewhat worrying juxtaposition between action and perceived outcome, perhaps emphasises the need for any assessment that is undertaken to be more specific, directive, and potentially evaluative as far as future intervention is concerned.

Gipps, Gross & Goldstein (1987), also comment on the issue of withdrawal as a method of supporting children with learning difficulties. They suggest that when withdrawal is used purely for the learning of reading, it is not a useful educational exercise. They do, however, also point to the benefits accruing

from increasing the child's self confidence and feeling of security, and observe that in some instances withdrawal will be educationally positive to the extent that it involves high levels of concentration, effective time on task, and good and appropriate liaison between the support teacher and the class teacher. In fact, in their study, the main disadvantages of withdrawal were found to stem from instances where there was poor liaison between a class teacher and a specialist support teacher. In pointing out that the most useful interventions with children with learning difficulties come from systems that maximise concentration, interest, and appropriate time on task, in addition to encouraging higher order educational interactions between the support teacher and the child, Gipps, Gross & Goldstein further emphasise the importance of the adoption of assessment and intervention models which maximise class teacher involvement, and which have appropriate and on-going in-service support. A structure which focuses on the actual content of a child's curriculum and the pedagogical implications following from that, is important in ensuring that maximal benefits flow from intervention. They finally conclude that there is no one ideal way of supporting children with special needs in mainstream schools. What is seen as important is the adoption of a strategy which focuses teachers' thinking, which ensures on-going liaison with different support specialists, and which is sensitive to the needs of the child in relation to the resources available to meet these needs. At all times, teachers need constructive feedback and in-service support to ensure the continued focussing of objectives and the maximising of resource potential.

15.7 Conclusions.

Studies such as those by Croll and Moses (1985), and by Gipps, Gross and Goldstein (1987) seem to highlight the need for assessment and intervention to be not only sensitive to the unique pattern of needs of the individual child, but also to lead on to clearly defined and evaluated objectives which can be met within the context of the classroom, within the context of a withdrawal system, or within a combination of both. The need for on-going and goal directed liaison between all the professionals involved is crucial, and a programme of appropriate in-service support for staff is also important. While Warnock has produced a clear philosophical shift in emphasis, this is not always matched by the day to day practices within schools. A child centred approach - which views the child's needs as central within any context - remains a realistic and attainable goal, provided appropriate support is made available to the professionals most directly involved in working with the child.

15.8 The Multimodal Approach and Recent Research.

The Warnock emphasis on considering the strengths and weaknesses of the whole child clearly interacts well with the Multimodal philosophy, where the BASIC IB gives a total profile of the child. BASIC IB could prove a useful framework in broadening the emphasis out from the presenting cognitively based deficit (C Modality) - e.g: poor reading skills - towards an understanding of the importance of all the vectors of the BASIC IB, both in

isolation, and also in an interactive sense. The BASIC IB framework could not only provide a delineation of tasks, it could also provide a focus for meaningful inter-professional liaison and interaction.

This conceptual shift away from the deficit model of learning difficulties, towards an interactive and prescriptive holistic profile is ideally suited to the BASIC IB Schema of the Multimodal Approach.

16. A MULTIMODAL APPROACH TO LEARNING DIFFICULTIES - AN OVERVIEW

Throughout the review, it has been suggested that when the various facets of the research are considered, the seven modalities of the multimodal perspective - BASIC-IB - do provide a useful framework which can tie the literature down in a fashion that becomes conceptually manageable for the psychologist.

Lazarus (1976, 1981, 1985) argues that the Multimodal perspective provides a complete and comprehensive overview of individual functioning within a given context. Thus, it would not be surprising that in an area as diverse as children with learning difficulties, the literature should represent perspectives across the whole range of the BASIC-IB. Whether it has been the intention of researchers to look at the more central processes involved with reading and its related activities, or whether more general related factors are considered, it can be argued that the Multimodal framework provides a conceptualisation which can integrate the diversity of research findings on the one hand, and also direct the psychologist's thinking in a manner that may lead to the most effective intervention programme being devised. It has to be emphasised that the multimodal approach is not about trying anything and everything in the hope that somewhere along the way something is going to work, the disciplined and structured use of the multimodal approach is designed to guide interventions in a logical, structured and coherent manner, and also benefits from the tendency to keep a broad overview of the individual's difficulties and to avoid the intervention getting tied into too reductionist thinking patterns, which demand a narrowing of approach.

It is highly unlikely that any one area of research is going to provide definitive answers to the problems of children with learning difficulties in the forseeable future, and it may be argued that it is important too to capitalise on the many advances and the good work that has been done to date in this area. It would be the contention promoted in this thesis that the multimodal approach is a valid and useful framework for the psychologist to adopt in this instance.

CHAPTER THREE.

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RESEARCH DESIGN AND METHODOLOGY.

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1. INTRODUCTION

The focus throughout this study has been upon the individual and the unique profile of needs that each has. No assumptions about the representativeness of groups can be made, and the psychologist and researcher has to continually balance the needs of the client group against the demands of a research methodology. With this in mind, an appropriate methodology is of crucial importance, and consequently, it would be the intention of this review to take an overview of research and evaluation, and then to consider the most appropriate way forward in terms of the needs and objectives associated with the research described in this thesis.

2. EVALUATIVE RESEARCH

2.1 INTRODUCTION

In looking for strategies which might be useful in terms of the current research project, it seemed appropriate to turn towards the literature on Evaluation research, as this may offer a model with which to consider the substantive issues. Cronbach (1982) seems to be in tune with these requirements when he suggests that evaluative research is concerned with making a serious attempt to improve a programme or intervention strategy by looking critically at its achievements and the fate of its clients. Responsibility for educational decisions is widely diffused in many instances, and those who may be participants in the decision making process often have discordant interests, and consequently to provide evaluative information for everyone's benefit can only lead to more effective and appropriate decisions being taken.

2.2 MAJOR FEATURES OF EVALUATIVE RESEARCH

2.2.1 PRINCIPLES BEHIND EVALUATION RESEARCH

Evaluation research in a social science context can be seen as a historical process which has evolved out of the fields of research, management, policy planning and information utilization. Rutman (1984) offers a generally acceptable definition of evaluation when he suggests that it entails the use of scientific methods to measure the implimentation and outcomes of any given programme, which will facilitate decision making. However, there would appear to be considerable debate within the field of Evaluation research as to what the concept of "Scientific" might mean in this context.

Cronbach (1982) identifies two somewhat extreme positions in this debate. At one extreme there is the Scientistic Ideal, which most easily equates with the Experimental method described later. This would involve the random allocation of subjects to groups, identical pre and post testing, and deliberate intervention being undertaken with the experimental group. Some researchers, such as Fairweather (1980), would argue that any attempt to measure the consequences of social intervention must be scientific, and essentially scientific is being equated with experimental in this context. Gilbert, Mosteller and Tukey (1976) see anything else as unsatisfactory: "Inadequately evaluated programmes can usually be regarded as 'fooling around' with the people involved."

At the other extreme, Cronbach (1982), identifies the Humanistic Ideal. Researchers from this tradition will find experiments unacceptable, and would tend towards the study of programmes already in place, and would not seek to impose a programme onto a given situation. The objectives of the evaluation would be seen in different terms. Benefits and drawbacks of any programme would be described and not reduced to some measurable quantity. Observation would be opportunistic and dependent on local context, and not pre-structured. Eisner (1978) criticises the scientistic norm which suggested that an ounce of data is worth more than a pound of insight. Stake & Easley(1978) possibly represents the epitome of this extreme view when he suggests -

" ... We need to portray complexity. We need to convey holistic impressions, the mood, even the mystery of the experience. Such styles are not likely to be those of the specialist in measurement as theoretically minded social scientists,"

Stake (1978, p162-164)

Thus, it can be seen that the field of Evaluation generally stretches between these two relatively polar extremes. Advocates of tight evaluation design will see the role as serving centralised decision makers, where the need for a standard policy to be implemented widely is recognised. Such centralised decision makers will demand data that can be shown to be relatively objective, as often they will be responsible for allocation of considerable resources, and policy decisions which may have far reaching consequences. The more subjective evaluations tend to be of more value "in situ", in helping individuals on the ground, to perceive and evaluate their own practices and activities differently. Other writers such as Cook and Campbell (1979) do not necessarily see the two extremes as mutually exclusive. In an applied setting they argue that experimental methods may have their place, but only if the manipulation under test can be shown to be of genuine value and interest, whereas they point to the value of less formal methods as being appropriate while a programme is evolving. Gilbert, Mosteller and Tukey (1976) see the rigorous experimental approach as being the "capstone" of a development, which may evolve from more subjective insights and observations. However, it would always have to be borne in mind that whether an evaluation design is construed as strong or weak, all conclusions deriving therefrom are inferences. They will reach beyond the data with the aid of the presumptions and assumptions that the consumers

of the evaluation bring to the process, as well as the assumptions the research procedures are based on. Essentially, therefore, many considerations have to be borne in mind when undertaking a programme evaluation in an applied setting, but the overall objective will always be to provide information that will be of practical value to individuals whose remit involves the making of decisions about the use of resources. Within the field of applied Educational Psychology, potential consumers of such evaluative information may be teachers, administrators, social services or other professional psychologists. Evaluation, ideally, seeks to provide them with maximally useful information to facilitate their decision making.

2.2.2 THE PROCESS OF PROGRAMME EVALUATION

It will be useful to consider some of the basic processes involved in setting up and implimenting an evaluative programme.

(a) Defining the Client Population

This can be considered from two perspectives. On the one hand, it has to be clear for whom the evaluation is going to be carried out. In other words, who will be the consumers of the outcome results? Almost inevitably, numerous competing interests will have a stake in the outcome - e.g.: administration, pressure groups, clients' groups etc. Regardless of these, the researcher must bear in mind what the potential client population is, and their competing demands and expectations from the evaluation. Conclusions, as they evolve, will have to be directed appropriately to the consuming population.

The other important aspect of client definition involves a clear statement of the characteristics and criteria applicable to the population that the intervention seeks to serve. This can range from the very broad and general, eg.: all socially deprived families in the city of Glasgow, to the much more specific, eg.: all blind children of school age living in a given defined geographical zone.

Before any evaluation is planned, the clear definition of such client groups is vital.

(b) Determining the Purpose of the Evaluation

The researcher should be quite clear about the overt as well as being aware that there may be possible covert purposes of the evaluation process. Chelimsky (1978) suggests three main purposes for evaluation.

(1) Accountability

The increasing demand for greater and greater accountability, especially in areas not readily amenable to more objective evaluation has been a major impetus for programme evaluation strategies over recent years. Cost efficiency and value for money are issues which have clear political and bureaucratic dimensions. In essence, there is an increasing and growing requirement that the worth of any programme be reported and thereby demonstrated, if it deserves to receive continued support through the public (and private) purse.

There can also be an internal dimension to accountability. Questions have to be directed as to whether or not the programme is achieving its objectives, whether the clients

(i.e: consumers) are happy with the programme, how does the programme compare with alternative strategies of pursuing the same objective, and what, if any, are the unintended effects - especially negative ones? Such questions should be of seminal interest to those most intimately involved with programme delivery, and forms a vital component of accountability.

(2) Management

When considered from a management perspective, evaluation can be considered as a vital tool for the making of improved and more enlightened decisions about programme design, delivery, and the resources that should be appropriately deployed. The prime use of the information in this instance is to modify services and delivery in order to increase effectiveness. Whereas the accountability perspective tends to ask the question - "Is the programme any good?", the management perspective will tend to ask the question - "How can the programme be made better?" Thus, improved programme delivery is paramount in this sense.

(3) Knowledge Base

It would be wrong to think that because programme evaluation strategies tend to emphasise the practical issues as outlined above, they do not contribute to the pool of knowledge regarding any particular issue. There can be a major contribution, and potentially important addition to the

state-of-the-art in different areas of practice. It may well be that a well evaluated programme may lay the foundations for far-reaching innovations in the longer term.

Clearly, these three differing perspectives as outlined by Chelimsky (1978) are not mutually exclusive, but the three components of the purpose of evaluation will be useful for the researcher to bear in mind.

Schuman (1967) also cautions against the dangers of any hidden or covert purposes that may be present in an evaluation. He suggests various aspects of such a "hidden curriculum" that need to be borne in mind.

(1) Evaluation may be undertaken in order to whitewash a programme - manipulation of the methodology can achieve this end. (eg.: ask questions only about cost effectiveness).

(2) Evaluation may be used, in a similar manner to (1), only this time to undermine or destroy a programme.

(3) Evaluation may be undertaken in a half hearted and token manner, and bring very little information of consequence to light.

(c) Planning the Evaluation

Programme evaluation will always require careful planning to ensure that the research will be relevant and credible. Rutman (1980) and Wholey (1979) emphasise the need for what they define as an Evaluability Assessment. This will focus on the programme

and address various fundamental questions -

(1) Is the programme itself clearly described and well defined?

(2) Is the programme being implemented in the prescribed manner?

(3) Are the objectives of the programme clearly defined?

(4) Are the objectives as defined plausible and within the scope of the programme?

The answers to these initial general questions will tend to dictate the extent to which it would be appropriate to undertake an evaluation of the more detailed effectiveness of the programme.

A second, and particularly important aspect of planning the Evaluation will be to decide on the most appropriate methodology to use in order to achieve the purposes of the evaluation.

An evaluability assessment will result in general terms of reference that will include the objectives of the evaluation, the issues and the questions to be addressed, the information to be collected, the appropriate sources of data, research design, time scale, and resource requirements.

(d) Conducting the Programme Evaluation

In general, the conducting of the Evaluation will entail the collection of appropriate data and the subsequent analysis of this data.

(1) Programme Details

Information will have to be collected on the actual process of intervention that is being undertaken. This may involve just one specific programme, or several if there is a wish to make comparative judgements about different programmes. Such information on the actual process of the programme should help in answering one or more of the following types of question.

- How was the programme implimented?
- Was the programme implimented in the prescribed manner?
- How does the manner in which the programme was implimented affect the subsequent results?
- What is the most cost effective way of operating the programme?
- How do different programmes addressing the same objectives compare?

(2) Objectives

A clear statement of the programme objectives will have to be made in order to determine the extent to which a programme has achieved these objectives. Statement of objectives, and their subsequent measurement, are clearly a central feature in any evaluation research.

(3) Starting Conditions and Antecedent Events

It is always important to clearly specify the conditions and contexts under which the programme is set to operate.

This will include information regarding the characteristics of the client population, and the characteristics of the professionals and practitioners involved in the programme. Such information can help to address the following important questions:

- What clients benefit most from the programme of intervention?
- What professionals are likely to produce the best results?
- What context would appear most conducive to achieving the programme's objectives?

(4) Intervention

An important characteristic of Evaluative research is the on-going nature of the information gathering. In most instances, rather than rely on the more conventional pre-test, post-test data, information will be gathered on an on-going continuous basis. There are several important reasons for this:

- Events and circumstances arising while a programme is in operation have an important influence on performance e.g. staff turnover; changes in clients' circumstances; other interventions that may be introduced.
- The measurement of such intervening conditions may help to illuminate the final evaluation by identifying possible linking or bridging factors between the programme and its assessed outcome.

(5) Data Gathering

Part of the intervention strategy will involve previously agreed decisions about the type of data that is to be collected and the manner in which this may be done.

Typically, such data collection may include:

- questionnaires : structured and/or unstructured.
- observations and ratings.
- standardised tests.
- interviews.

The choice of the data to be collected and the appropriate manner of collection will be a function of the particular study in question and an issue for careful pre-planning by the researcher; bearing in mind the overall objectives of the evaluation and the important issues of validity and reliability. A well-designed and executed programme should seek to minimize any data collection problems.

(6) Data Analysis

Clearly the format of any analysis of data, and any statistical methods employed, will be a function of the overall programme and evaluation design. The critical feature always remains the need for the consumers of the evaluation to draw appropriate inferences about the performance of a programme. Inadequate attention at this stage may lead to misleading or erroneous conclusions about the efficacy of a programme or intervention.

(e) Ultimate Utility of the Evaluation Process

Once a programme has been carried out in the field, and the data gathered appropriately evaluated, the final consideration remains as to the presentation of the information to the appropriate decision makers or authorities. Unless the decision maker can understand, assimilate and feel a part of the evaluation process, then there is a limited likelihood that even the most important outcomes will lead to change in a manner that could be deemed as appropriate. The researcher will always have to bear in mind:

- who is the evaluation targeted at?
- what are the important characteristics of the population? e.g. political, professional etc.
- how can the information be most efficiently presented in a manner that avoids bias and prejudice?

As Weiss (1977) points out, there are a myriad of evaluations and reports that sit and gather dust on decision makers' shelves, and very often the reason for this lack of utility lies in the manner in which the final evaluation is presented. A balance has to be struck between an evaluation which goes over decision makers heads because it is too technically orientated, and one that is so simplistic that it appears naive and hence ignorable. Thus there may be a need for the researcher to be aware that the ultimate utility of the evaluation might be heavily dependent on the impact it makes in the appropriate places and this suggests a strong necessity for the evaluation presentation to be well planned and structured.

2.3 TYPES OF EVALUATION RESEARCH

At this point, it would seem appropriate to consider the broad categories of Evaluation research that can generally be undertaken in the applied field, and to consider the varying strengths and weaknesses of each in turn.

The need for differing types of evaluation follows from what Morell (1979) identifies as five major considerations in undertaking evaluation.

(a) As Forcese and Richer (1973) point out, a major aspect of research should be to describe events accurately rather than test specific hypotheses.

(b) The basic value or lack of value of a given programme or intervention is often accepted - rightly or wrongly - as given, and consequently the issues of concern may be ones of more specific detail such as the relative effect of the programme on differing populations, or what aspects of the programme may be requiring revision.

(c) Evaluation should help to form theories regarding the functioning and the effectiveness of programmes of intervention. Writers such as Harre (1970), Kaplan (1964), and Popper (1965) all argue that theoretical contributions are not necessarily restricted to experimental results, and that issues such as plausibility and reasonableness play an important part in the development of theory. Clearly, evaluation methodology has a lot to offer in this context.

(d) Evaluation studies should not only be concerned with effectiveness, but also with efficiency. As Morrell (1979) succinctly observes, efficiency may not be a part of scientific enterprise, but it is without doubt a cornerstone of technological progress and endeavour.

(e) Wiesner (1970) points out that evaluation studies have an important role to play in terms of problem solving. Problems tend to be solved by much more than the clinical application of scientifically evaluated methods, and by their very nature, draw upon a wide variety of information - such as may be delivered up by an evaluation study - in order to successfully solve difficult and often intractable problems.

With these major issues in mind, Morrell (1979), identifies three distinct classifications of Evaluation studies, viz:

(1) Client Comparison Studies.

(2) Follow up Studies.

(3) Modality Test Studies

2.3.1 CLIENT COMPARISON STUDIES

In Client Comparison Studies, evaluation is concerned essentially with the relative effect of a given programme on various subpopulations of clients. The interest focuses crucially on the varying psychosocial factors which differentiate any one group from another. It could be argued that the Client Comparison model is not so directly concerned with programme effectiveness per se, but with the relative effects of the programme. This is of particular importance in relation to the fourth of the points raised above regarding the role of evaluation

studies in the contribution to efficient planning of services.

2.3.1 (a) ADVANTAGES OF THE CLIENT COMPARISON EVALUATION

As was alluded to above, one of the most common objectives of this type of evaluation study is to identify individuals or groups who are most likely to be helped by a given programme of intervention. Although this may not relate directly to sound causal inference, it does crucially relate to the decision making processes in the field.

Another related use of the Client Comparison method will be in looking at the relative characteristics of groups who may be or may not be eligible for a given intervention programme.

e.g. comparing chronic school truants with those who do not truant from school.

Evaluation of this type may identify specific characteristics of a given population which may be of interest and importance in terms of planning and executing programmes of intervention.

Any intervention strategy in the applied field will normally have limits on its operation. These limits usually relate to funding and general resourcing. Hence, client comparison method can be of great value in potentially identifying individuals who may best benefit from the intervention. This has clear implications for the potential cost effectiveness of any programme.

The major advantage of the client comparison evaluation is thus; that it allows the researcher to investigate which types of changes are largest and most significant with particular clients or client groupings. Hence, a programme's pattern of success and failure may well vary with different clients, and such effect may only be

discerned if evaluations are able to detect meaningful distinctions between these varying client groupings.

It should also be noted that the Client Comparison method can have value in suggesting links between intervention and observed change. This can be done by documenting progress for particular categories of recipients of the intervention programme.

Client Comparison type studies clearly have their most fertile contexts in such fields as psychotherapy and specific educational intervention strategies, where the interest often lies in identifying the most appropriate consumers of any given programme.

2.3.1 (b) DISADVANTAGES OF CLIENT COMPARISON EVALUATION

The most obvious disadvantage of this type of evaluation, is the relatively low potential it has to contribute to the construction of a valid theoretical framework in some given context. It has always to be ultimately borne in mind that a tight and coherent model based on causal explanations is most appropriate in integrating information and helping to predict outcomes. Client Comparison methods will not address this issue, and thus are, incomplete.

To some extent this arises from the inherent difficulties in reliably differentiating populations. Very often the differentiation of client groupings will require the assessment of internal psychological states and their relation to the potential predicted behaviour. As Platt and Labate (1976) observe, the difficulty in accurately measuring internal psychological states is only surpassed by the difficulty of relating these states to subsequent behaviour.

The assessment devices and indicators most commonly used in client comparison studies tend to yield data which is a general gross indicator, and which is not finely tuned for the benefit of specific research purposes.

Also, even if it were possible to reliably differentiate populations, variables that may emphasise the reliable differentiation may be of little value in planning improved programmes. A knowledge of differentiator variables must go in tandem with a knowledge of which variables are truly crucial for effecting any desired change. Client Comparison methods are unlikely to provide detailed information of the nature.

In summary, it may be said that Client Comparison studies can be most useful when the populations being studied can be reliably defined in terms of variables which can be shown to be crucial in the change process, and this is not always easy to achieve.

2.3.2 FOLLOW-UP EVALUATION STUDIES

Follow up evaluation studies, as the name suggests, focus on an on-going follow up of clients who have terminated involvement in a given programme. The obvious function is to evaluate the long term effects of an intervention once the immediate effect of it is no longer present. Clearly, in any area where a service is provided for a given clientele, it is hoped that the beneficial effects (if any) of an intervention programme will remain with the clients for a reasonable period of time afterwards. This phenomenon of "attenuation with time" of a programme's effectiveness is well

recognised in intervention work. Essentially, the beneficial effects dissipate with time, increasing the likelihood of the necessity for further intervention at some time in the future. Hence, if the researcher is to obtain an accurate picture of the utility of a programme, then it will be of value to be able to make an estimate of such an"attenuation phenomenon".

2.3.2 (a) ADVANTAGES OF FOLLOW-UP EVALUATION METHODS

Any programme of intervention in any aspect of human services must have regard to the long term efficacy of that programme, and consequently the major advantage of Follow-up Methods of evaluation will be that they will provide information on the longer term effects for use in subsequent revisions and alterations of service delivery.

Follow up evaluations may also have the benefit of determining and identifying any unintended consequences of a programme - beneficial or otherwise. Kozol (1967) cautions that it is often best to assume that any form of social/educational intervention strategy will have unintended consequences, and the subsequent identification of these is clearly an important role of the evaluation process. Without a follow-up, at best, a partial or restricted view of programme success is likely.

The amount of change effected by a programme, and possible variations over time,are important considerations in any evaluation, and this cannot be investigated fully without a follow-up evaluation study. Educational intervention, as an example, is an extremely complex process, and its effects are assumed by all concerned to be pervasive and long term. Follow up evaluation can be of great benefit in

assessing the nature of such effects.

In a more detailed sense, it is also important for the researcher to know the manner in which programme effects alter over time. Such information which requires detailed follow-up, will have a direct and crucial bearing on future programme planning. Bronfenbrenner (1975) in taking a comprehensive review of literature in areas of social and educational intervention programmes, points out that long term follow up research can yield some insights into long term attenuation effects, thus helping in the better design of subsequent programmes.

A final advantage that follow-up evaluation studies produce is that they separate the researcher from the day-to-day business of the programme which is being evaluated. Morrell (1979) suggests that this is a necessary component of successful evaluation as it avoids the tensions and biases that may arise when evaluators and researchers are also involved with the programme application. The threat to validity of the researcher having too great a commitment to the programme is obvious.

2.3.2 (b) DISADVANTAGES OF FOLLOW-UP EVALUATION METHODS

Follow-up evaluation may provide useful information regarding the process of transition over time, but it is unable to tackle the issue of the process by which a person is initially affected by an intervention programme. Flanagan (1954) points out that people's memories regarding actual change processes are far from reliable, and thus it is unrealistic to expect follow-up studies to elicit reliable information regarding which elements of a programme are most instrumental in influencing change in the first instance.

Even if it were possible to identify lasting change, such changes are liable to become increasingly more subtle and complex as they interact with the multitude of factors impinging, over time, on any individual's life.

A more pragmatic difficulty that faces any Follow-up evaluation is the relative cost and difficulty of identifying, locating and obtaining data from subjects who had previously been involved in the programme. Problems of geographical dispersion, drop out or simple lack of interest will continually place barriers in the way of effective follow-up evaluation. Also, in situations where subjects do remain willing and able to participate in a follow-up study, it may still be prohibitive in terms of cost and man hours, in instances where a lot of travelling is concerned.

A possible consequence of these pragmatic difficulties is that there will always be a danger of carrying out a Follow-up study on what would ostensibly be a biased and unrepresentative sample. It is argued that very often subjects who most readily make themselves available for follow up studies may well be those who hold extreme opinions - either positive or negative - about a given programme. Also, pragmatic decisions to only follow up subjects who could be readily identified and traced may well lead to distortions in the follow-up data.

Clearly, when considering these difficulties it is important that the researcher should bear in mind that Follow-up evaluation, in and of itself, will be unlikely to provide administrators and decision makers with enough relevant information to take effective decisions. Follow-up Evaluation may best be seen as an aspect of the overall evaluation process, to be used in concert with other evaluation strategies.

2.3.3 MODALITY TEST EVALUATION

This type of Evaluation method is most applicable when considering the efficacy of differing and possibly competing programmes. In this type of evaluation, the objective will be to estimate the relative effectiveness of a given programme or programmes in bringing about a desired change. In essence, the evaluation in this instance is most directly concerned with the precise assessment of treatment effectiveness. Whatever form a modality test evaluation may take, it will be based on the assumption that a given particular intervention programme (or part of it), will result in some detectable change in the client population. This has a fundamental and central role in any evaluation. Such an evaluation would hopefully focus on the nature of the relationship between intervention and change. Often within a modality test evaluation, traditional experimental methodologies are seen as the most desirable. Riecken and Boruch (1974), for example, would see this as the only legitimate form of evaluation. However, non-experimental methods may also form a part of Modality Evaluation. They may not be as tight as experimental methods, but nonetheless may be more appropriate in any given context.

2.3.3.(a) ADVANTAGES OF MODALITY TEST EVALUATION

Because information obtained from modality test evaluation relates directly to the effectiveness of a given programme, it is clearly the most appropriate approach to adopt when addressing questions of how a programme can improve its effectiveness. The modality test approach - regardless of the detailed nature of its design - has the clear advantage that the researcher has his efforts

directed to the very important ends of evaluating programme effectiveness. The emphasis in both Client-comparison and Follow up evaluation, while still being of value, is nevertheless focussed on other aspects of outcome.

The modality test approach has a strength in that it should seek to yield information on the magnitude of changes that are brought about by a given programme. Emphasis may be placed on the "practical significance" of a programme's effectiveness, as opposed to some experimentally derived "statistical significance", and the evaluator must continually bear in mind the extent to which the programme approaches the objectives set for it. It should always be borne in mind that because a particular change did not occur by chance, it is no guarantee that the change is important enough to justify its inclusion in any programme. This aim to link intervention to outcomes is very important - even if cause and effect cannot be definitively established - as it is necessary to try and understand the size and importance of effects in any programme context.

Clearly, as has been alluded to above, the modality test type of evaluation is best suited to traditional experimental methods.

2.3.3(b) DISADVANTAGES OF MODALITY TEST EVALUATION

The main problems with modality test evaluation are practical rather than conceptual. Obviously, high powered and tight experimental design can yield useful, high quality information which will be of great value to potential decision makers, and would be an ideal to aspire towards. For a tight modality evaluation, it is likely to require overt interference by the evaluator in the day to day running

of the programme, and as well as introducing contaminating variables, this can also introduce a high level of strain and tension between researchers and the "on-site" personnel responsible for programme implimentation. This is a difficulty pointed out by, among others, Aronson and Sherwood (1967), Twain (1975) and Zusman and Bissonette (1973). The problem tends to be exacerbated by the direct correlation between the power and tightness of its evaluation design and the potential vulnerability to small procedural changes.

Thus, essentially, the researcher has to bear in mind that typically, as the quality of outcome evaluation information goes up, so does the cost that has to be paid to achieve it.

2.3.4 EVALUATION RESEARCH METHODS - A SUMMARY

As has been seen, programme evaluation studies offer a wider perspective than more conventional research design methodology, while subsuming aspects of it. Regardless of the details of the programme evaluation structure, it can be succinctly stated that:

(a) Evaluation studies entail the use of scientific and quasi-scientific methods to study the implementation and outcome of a given intervention programme.

(b) Programme evaluation focuses on the structure of the programme.

(c) Programme evaluation defines the objectives of the programme.

(d) Programme evaluation concerns itself with both the implementation and outcome of the programme.

(e) Programme evaluation includes both periodic studies and on-going monitoring of systems.

(f) Programme evaluation should provide useful information that can be used for decision making purposes.

We have also looked at how there are different types of evaluation studies each with their own particular strengths and weaknesses, and at the end of the day the researcher has to balance out the various factors which are important to the given research programme under consideration, and build an evaluation model around that programme in the context that it operates.

2.3.5 EVALUATION STUDIES AND THE CURRENT RESEARCH ISSUE

When considering the most appropriate form of research methodology for the research project under consideration in this thesis, the following factors were seen as being important:

(a) Context

In this sense, the context refers to the social, professional and administrative situation that the research would have to be done in. The research was to be conducted within the parameters and remit of a busy Child Guidance Service serving the Educational provisions in both rural and urban contexts within Strathclyde Region. The target population was children referred by schools to the Child Guidance Service and assessed as having significant learning difficulties which would require additional support outwith the normal provision within schools. (Details of the population will be given in a later section of the thesis.) The children were liable to be drawn from a variety of different schools, each with their own unique strengths and weaknesses, and to present with an individual profile of

psychological and sociological characteristics. The intervention programme would have to be planned within the existing parameters of provision of both the Child Guidance Service and the local schools.

(b) Objectives of the Research

There were two main overall objectives that the research exercise sought to address:

(i) It was the intention to compare three varying strategies one experimental and two "established" - see later section for details) in terms of their effectiveness for helping the identified children with learning difficulties.

(ii) Bearing in mind the time constraints on both schools and Child Guidance Services, and the need to deploy existing resources in the best possible manner, it was considered important that the information emanating from the research would allow both professionals - psychologists, teachers, and administrators, to make informed judgements about staff and resource deployment that would attempt to take account of as many relevant factors as possible.

There were several other somewhat lesser, but also important objectives that the research sought to address:

(iii) It seemed that much of the existing practice and provision within Child Guidance Services for children with learning difficulties was, at best stereotyped, and at worst, ad hoc and variable. An objective of the research would be to describe these practices in some detail.

(iv) It was also considered as an important objective that the whole process of both intervention and evaluation be undertaken in a manner that was realistic and viable within the day to day functioning of a Child Guidance Service. Hence, the methodology would have to pay attention as far as possible, to the principle of realism. It was strongly felt that there was no point in instigating a grandiose and elaborate intervention programme and subsequent evaluation, which had no realistic chance of ever being taken up or implemented because of cost effectiveness and resource implications. Essentially, therefore, realism in context was seen as a pre-requisite.

(v) It was also hoped, that in some small way, the intervention programme would add to the pool of knowledge and resource information within applied Educational psychological practice.

Both the heterogeneous nature of the contextual factors, and the types of general objectives set for the programme and its evaluation, suggested that the methodology adopted would not reflect the more traditional experimental methodology for the following reasons:

(i) The number of children referred at any given point in time to the Child Guidance Service with specific learning difficulties is relatively small, and certainly would not sustain the necessary numbers for a traditional experimental/control group design.

(ii) The heterogeneous nature of the population also rendered conventional "matching" strategies impossible.

(iii) The need to provide a useful, viable and professionally 'honest' service to all the subjects involved raised clear issues of ethics which would make the creation of a 'no action' control group quite unrealistic.

In terms of the types of evaluation methods previously discussed, the research objectives suggested the following:

(i) The need to not only compare but also to describe in detail some different programmes suggests both Client Comparison and Modality Test approaches to evaluation.

(ii) The need to provide useful information for decision making purposes again suggests the Modality Test type of evaluation.

(iii) Issues of effectiveness were also having to be considered alongside issues of efficiency and cost effectiveness, and this again suggests the use of both Client Comparison and Follow up types of studies.

In summary, it can be said that it is the author's observation that although time constraints and a genuine lack of interest are, in themselves, important reasons as to why there is relatively little applied research in the field of Educational Psychological practice, another important and often overlooked reason would seem to be a lack of appropriate research design models which attempt to address themselves to the complexities of mixing applied services with research. Consequently, because the more traditional experimental methods are recognised as being quite inappropriate, little effort is given to thinking about research by Educational Psychologists, when, in fact,

it is one of their statutory roles in terms of the 1981 Education Scotland Act.

It would seem that were viable, practical and useful methodologies made available, then there is a greater likelihood that this important research role for the applied psychologist could be encouraged.

It would seem that an evaluation strategy which addresses these issues, would be an important step forward for Educational Psychology.

Footnote:

Details of the actual methodology adopted is given in the appendix to this chapter.

3. CONVENTIONAL APPROACHES TO PSYCHOLOGICAL/EDUCATIONAL RESEARCH

3.1 INTRODUCTION

Within the field of applied psychological and sociological research, there are three broad approaches that are commonly adopted:

1. Ethnographic Studies
2. Survey Studies
3. Experimental Approaches.

We shall briefly consider the first two, before going on to look at the third in considerably greater detail.

3.2 ETHNOGRAPHIC STUDIES

Ethnographic research is research which is carried out in the field, and in which the methodology is basically one of observation of the subjects/groups/cultures under study in their 'natural' settings. An example of this style of research might be that of Whyte (1955) who was interested in gang member behaviour, where the necessity to observe 'in the field' became a sine qua non for understanding the gang member's behaviour.

3.2.1 ADVANTAGES OF ETHNOGRAPHIC STUDIES

The major strength of this kind of methodology is that it is naturalistic, and the crucial role of context is kept paramount in the researcher's considerations. The ability to observe spontaneity is something which is most likely to be possible in this type of research. Also, by the observation of social interactions, it is possible to reach hypotheses about covert behaviours and meanings

in a way that becomes very difficult - if not impossible - with other more formalised strategies.

3.2.2 DISADVANTAGES OF ETHNOGRAPHIC STUDIES

The most obvious problem with such a methodology is that it is laborious and time consuming. The researcher has to be 'accepted' by the group under study, and this is not always easy, and may well be a long term process. Lacey (1970), for example, in a study of school children in the classroom situation, got around this first problem by using the teachers as the researchers/observers, but this merely serves to create other difficulties, most notably one of role differentiation between impartial observer, and involved teacher.

Also, ethnographic studies because of their basic nature do not readily give themselves over to short cuts or simplification. No matter how well the study is set up, there is no way that the effect of variables acting outwith the observation period can be dealt with, and, because such studies are necessarily contextually based, there is a massive problem of generalisability of findings. The final, and possibly most obvious difficulty of such studies, is the reliability of the observations made. The observer's own theoretical commitments and preconceptions will often be critical in choices and emphases placed on observations.

3.2.3 ETHNOGRAPHIC METHODS AND THE CURRENT RESEARCH ISSUE

Clearly, the main use of ethnographic studies is in naturalistic sociological studies, where group behaviours are being looked at. In the present research, the focus is on individual pupils with unique personal profiles of difficulties, and although the

manifestation of some of these difficulties occurs in a social setting, generally speaking, an emphasis on social context will be unsuitable for this type of analysis. While some attempt is made to consider the child in context in this study, the methodology could not be considered ethnographic.

3.3 SURVEY METHODS IN RESEARCH

As the name suggests survey methodology involves the sampling of opinion from a wide population in order to make generalisable statements about that population. In an extreme case - like a national census - the survey population will be the total defined population. More commonly, once the target population is defined - eg.: all children with learning difficulties in primary schools - representative samples are surveyed. In essence, the survey method requires a sample of respondents to reply to a fixed number of identical questions under comparable conditions. The results from representative sampling may be generalised, or comparisons between sub-groups within the sampled group across a specific question, can be made.

3.3.1 ADVANTAGES OF SURVEY RESEARCH METHODS

A major strength of the survey methodology will be the ability to elicit large amounts of information covering significant time scales in a relatively short period. This is a clear advantage that observational methods will not have. Thus, cost effectiveness of information gathered against time taken is the major advantage of survey methodology.

3.3.2 DISADVANTAGES OF SURVEY RESEARCH METHODS

There are various penalties which have to be paid for the advantages and strengths of survey methods as described above. Where the surveyed responses are being obtained by face to face interview, the danger of interviewer bias - deliberate or unintentional - is always present. Questions may be re-phrased in a manner that is likely to increase the probability of getting a specific response which may not necessarily reflect the views or opinions of the interviewee. On the other hand, where questionnaire methods are used,the questions are always open to distorted interpretation on the part of the respondee. The attempt to produce comparable information by the restriction of response options (eg.: yes/no or 5 point scale choices), leads necessarily to the obscuring of subtle differences in behaviour or attitude, and what may be of crucial importance, especially in a therapeutic or educational intervention setting. So, it can be seen that the major disadvantage of survey methodology remains the trade off of depth and subtlety of information in order to achieve comparability.

3.3.3 SURVEY METHODS AND THE CURRENT RESEARCH ISSUE

As is clear from the above, the use of survey research methods is most applicable in sampling attitudes and opinions across a given population. In the earlier stages of this research project, where the main task was to ascertain various professionals' opinions regarding the objectives of assessment and intervention with learning disabled children, then issues pertinent to survey methods were clearly relevant, and this will be discussed in more detail in

the appropriate section. However, at the later assessment and intervention stages, where the need was to elicit fairly detailed and individual information about each child, then clearly the relatively small and unrepresentative subject samples made survey methodology inappropriate. In essence, while some features of survey methodology may be appropriate, it does not allow for the depth or type of analysis required by this study.

3.4 THE EXPERIMENTAL APPROACH TO RESEARCH

3.4.1 INTRODUCTION

The experimental method represents the backbone of much of the research undertaken by psychologists. It is argued that, in order to understand processes fully, it is necessary to be able to exercise control over variables that may be implicated in the phenomena of interest to the researcher. If this cannot be done, it is argued, it will be impossible to ascertain the relative effects of specific variables - a pre-requisite in understanding psychological processes as a whole. Experiments are typically designed to investigate the effects of several variables - either separately or in interaction. By tightly controlling events in the laboratory setting, the researcher hopes to gain insights which can be generalised to other contexts. (Context itself can, of course, be an important variable, and an awareness of this tends to highlight the limited usefulness of experiments in an applied field setting.)

3.4.2 TYPICAL EXPERIMENTAL DESIGN - A DESCRIPTION

We can consider what would - in theory - be seen as the ideal experimental set-up.

All psychological research will commence with the statement of a hypothesis that the researcher is interested in testing. The population that the experiment is to be carried out with is approached, and at least two randomly selected groups are created - one to act as an experimental group and the others as control groups.

(i) Experimental Groups

The subjects assigned to the experimental group will undergo the intervention that is being considered. Eg.: in a simple case, the experimental group in a study considering the effect of physical punishment on performance of mentally handicapped youngsters on a given task, would receive the previously stated physical punishment if their performance did not reach certain previously agreed criteria.

(ii) The Control Groups

The subjects assigned to the control groups will undergo identical experiences to that of the experimental group, with the exception of the crucial variable or variables under consideration. In the simple example given above, the control subjects would not receive the physical punishment for failure to achieve on the given task.

In order to have some measurement of the impact of the intervention, clearly there is a necessity for establishing a pre-intervention

baseline. All groups will be assessed identically on appropriate indices prior to the experiment - Pre-Test. After the experimental intervention has been completed, all groups will again be assessed identically on the same indices - Post-Test.

Thus, at the end of the intervention - whatever it may be - there will be Pre-test and Post-test data for both the Experimental and the Control subjects.

At this stage in the process, the researcher typically turns to the use of statistical analysis. If the initial random selection has been properly carried out, there will be no statistically significant differences between the groups on the pre-test. Statistical analysis of post-test data can then be used to check whether any differences between the groups which emerge are large enough to defy explanations in terms of chance variations. More complex studies may use more sophisticated statistical techniques such as an analysis of variance, for example, which will allow interactive effects of several complex variables to be analysed in a manner that allows for quite subtle interpretation. This is not the context to consider statistical methodology, although the implications flowing from the use of statistics will be considered in some detail later on.

Thus, such tight and controlled experimental methodology allows the researcher to view the hypotheses as either confirmed or disconfirmed.

3.4.3 ADVANTAGES OF THE EXPERIMENTAL DESIGN

The major advantages that can be claimed for the Experimental method basically stem from the fact that the researcher can exercise considerable control over the course of events, and consequently is able to manipulate situations in order to test various hypotheses, which will help to build a comprehensive picture of the phenomena under study. The ability to control and manipulate the experimental situation is vital in order to make the data meaningful and useful. A well designed experiment invariably makes it easier to identify a relation of causal dependency between two variables.

As stated before, the use of quite sophisticated statistical analysis allows the relative interactive effects of variables in quite complex situations to be explored.

3.4.4 DISADVANTAGES OF THE EXPERIMENTAL DESIGN

While the Experimental model provides the laboratory based psychologist with a battery of useful tools with which to undertake research, the inadequacies of the experimental model begin to become more apparent when the psychologist seeks to take research out into the applied field. As Rausch (1974) points out, the failure of integration between applied psychological practice and research methods of a traditional experimental nature, is due in a fundamental way to the inadequacies of the experimental method in tackling applied psychological problems. Bergin and Strupp (1972) suggest that problems for study in the applied setting are given less emphasis than the minutiae of experimental design, and that this has the potentially dangerous consequence of the selection of problems

for study which will fit existing experimental design paradigms.

There are various other problems that have to be considered in some detail:

(a) Statistical Significance

Application of statistical methods to the data from experiments presents the researcher with a measure of the probability that might reasonably be attributed to a particular outcome occurring as a result of manipulation of variables, in relation to the probability that the same outcome may have occurred by chance. This can lead to considerable difficulties. At the simple level, there is the ever present danger that a result reported as being statistically significant is interpreted as having the status of a virtual fact. More importantly, it is clear that statistical significance levels distract attention from sources of variation, which may lead researchers to assume that experimental effects are important if they simply reached statistical significance, even though in reality, the effects may be very weak. Even when properly interpreted, statistical significance gives no indication of the relative importance or the size of the significant effect. Meehl (1978) suggests that reliance on statistical significance may well be one of the worst things to happen in the history of psychology. But nonetheless, once statistical significance is achieved, there is a temptation on the part of others to assume that the result is indeed one of genuine significance, and more importantly, that it is clinically or educationally important. Carver (1978) is particularly scathing about this approach, and suggests that researchers should simply ignore statistical

significance testing in research design, on the basis that results which cannot be interpreted without considering probability values inherently stem from poorly designed studies in the first instance. Also, as Barlow (1981) points out, in applied settings, statistical significance says nothing about an individual subject's reaction to a specific intervention strategy.

Essentially, the use of experimental methods which yield statistically significant results will be of limited value to the researcher who wishes to understand in what way a specific intervention has effected change in a particular individual. In some instances change may be dramatic, in others minor or negligible. Too much reliance on statistical significance may tend to obscure other factors that can be so important for the applied psychologist.

Thus, in the applied setting, one of the main cornerstones of the experimental method would seem to be of limited practical value in terms of making clinical and intervention judgements.

(b) Subject Homogeneity

The experimental model requires random allocation of subjects to experimental and control groups. The purpose of this process is to justify an assumption that in respect of potentially important variables, the two groups can be said to be homogeneous, therefore ensuring that the influence of the experimental variable will be clearly highlighted. Again, this is an ideal that can more readily be aimed at in a well controlled laboratory setting, but when the research moves out of the laboratory and into the applied setting, the difficulties associated with matching subjects become virtually

insurmountable. It has, of course, to be pointed out that matching subjects is not the same as randomly assigning them to different groups. In an applied setting it is highly problematical to randomly assign subjects to treatment or non-treatment groups, as this has moral and ethical implications about the withholding of potentially valuable treatments from those in need of some help. This is not to say of course, that it is impossible to identify certain client populations in an applied setting. For example, learning disabled children can be defined as operating within a certain IQ range, and as having a significant and agreed retardation in reading on a standardised reading test. However, if, say, ten such "homogeneous" children were presented, they would bring with them very different histories, personality variables and environmental contexts, to any detailed assessment. Kiesler (1966, 1971) describes the belief that subjects who are homogeneous in respect of chosen criteria are essentially similar in all important respects, as the subject uniformity myth - the most homogeneous feature of subjects being how heterogeneous they in fact are. Thus, this makes it extremely difficult - if not impossible - to generalise results expressed in terms of the average response of a group, to any individual subject.

It is therefore clear, that in any applied setting, the researcher will have to take account of the fact that a group of subjects are essentially highly individualistic.

(c) Cause and Effect

As already suggested, a major reason for a psychological researcher

to wish to manipulate variables in an experimental setting is often to enable him to make statements regarding specific cause and effect relationships. It is one thing undertaking this approach in the laboratory, but quite another in a real life setting. To undertake a study into cause and effect in the applied setting will rarely address the needs of the individual subjects concerned. This point is, of course, clearly related to the issues surrounding matching and random allocation to conditions already mentioned.

(d) Ethical Issues

As has been previously shown, when the experimental method is taken out of the laboratory and into any applied setting, ethical issues arise. The problem of undertaking deliberate, and possibly untried interventions with subjects who may be experiencing serious and distressing difficulties is an obvious one. The other side of the same coin is, of course, the deliberate withholding of a specific intervention from subjects who may well benefit from it. If one is going to undertake any novel intervention in the applied field, then this is always an issue that has to be met head on. The problem unique to the experimental method in this sense is the somewhat rigid and clinical nature of the design. Educational Psychology operates in an area of social sensitivity, and the ethical and pragmatic issues of research designs must remain uppermost in the researcher's mind. The laboratory based psychologist studies phonemena, such as perception, learning and memory for example, where the manipulations and interventions are usually in the form of relatively innocuous tasks which can be completed in a short period

of time. The Educational Psychologist must bear in mind the needs and rights of his client population, and his subsequent obligations towards them.

3.4.5 THE EXPERIMENTAL METHOD AND THE CURRENT RESEARCH ISSUE

Any researcher would clearly like to be able to make his design as rigorous and as water-tight as possible, and the experimental method offers an ideal to aspire towards in this sense. However, when we consider the current study, it is clear that it manifests many of the characteristics which make the use of the traditional experimental method at best suspect, and in reality quite impossible.

(a) All the children who get referred to Child Guidance for learning difficulties, and who subsequently - after detailed assessment - get taken on for a particular form of remedial intervention, have serious and immediate problems which may have a direct influence on their whole educational future. Consequently, the ethical issues discussed above become highly relevant, and the psychologist has to continually bear in mind the responsibility he has to the children, their parents, and the schools in general.

(b) The perennial feature of any child being assessed in such circumstances is the unique profile of strengths and weaknesses that they present. Consequently, the notion of a relatively homogeneous population could be considered a myth. Also, in this instance, a major feature of the research and intervention is based on assessing the profile of strengths and weaknesses and subsequently designing unique intervention packages around this.

Thus, a major emphasis is on the heterogeneous nature of the population, and not simply the homogeneous features which resulted in their all being referred as having learning difficulties. In such a situation, the adoption of the experimental model becomes quite inappropriate.

(c) The time scale of the research in question will also militate against traditional research design. Any child taken on for intervention and help - regardless of the strategy adopted - can expect to be involved in a programme which may stretch through, at minimum, one school session, and in some instances several years. Consequently, normal developmental and social change becomes a major source of contaminating variables in every instance, and there is no way that this can be controlled for.

All in all, it would seem clear that the traditional experimental model does not offer an appropriate paradigm in this instance, and that alternative methodologies will have to be considered.

3.5 THE NEED FOR AN ALTERNATIVE APPROACH

As has become clear in the preceding discussions, the Educational Psychologist who wishes to undertake an applied form of research generally finds the cupboard quite bare when considering the appropriateness of the more conventional forms of research methodology. This paucity in appropriate methodology has an influence when considering the general impact of research on applied practice.

In the field, there is an undoubted sense of disillusionment as to the contribution that the more traditional forms of research are making. Every day, psychologists find children referred for assessment and advice. The problem is looked at, conceptualised and intervention strategies suggested, with very little systematic research bearing on either the assessment or the subsequent intervention strategy. As Bergin and Strupp (1972) point out, it would appear that most practitioners learn their procedures from modelling their teachers, and consequently, any alteration in the procedures and intervention strategies learned in a professional training setting, are liable to be based on the trial and error experiences of the individual practitioner.

Barlow (1981) also emphasises that in any therapeutic or remediation setting, some subjects will always improve regardless of intervention used. Thus, there is always the opportunity for the psychologist to attribute any apparent success to the procedure or interventions used, and correspondingly to discount failure for one reason or another, usually relying on in-subject factors such as lack of motivation. Cohen (1979) further emphasises this point by showing that psychologists are more influenced by workshops, discussions with colleagues and descriptions of clinical innovations, regardless of their researched efficacy, than they are by research that has been clearly verified. The logical conclusion of this situation would seem to be that any subject referred to an Educational Psychologist for whatever reason, will end up with a potential variety of interventions for exactly the same presenting problems, depending upon the psychologist to whom the referral is made. This results in a highly individualistic

and necessarily patchy approach to practice, which may range at one extreme, from psychologists who may depend virtually exclusively on a particular test or procedure regardless of the presenting problem, to situations where a much more randomly eclectic approach is adopted in order to cover as many options as possible. Psychologists will tend to defend this situation in terms of clinical judgement. Wollersheim (1974) is much more cynical, and points out the dangers of this approach as somewhat akin to "crystal ball gazing". The danger of psychologists ending up "bunny hopping" between procedures, depending on what happens to be in vogue is obvious, and more importantly, there is little motivation, because of lack of appropriate research design procedures, to look more objectively at their practice, or to evaluate outcome.

The apparent lack of influence of research and evaluation on psychologists, both in terms of assimilating research findings, and in terms of evaluating their own practice, is a situation fraught with danger and difficulties for the applied professionals. It is doubtful that the consuming public would accept such a state of affairs in other fields of apparent technological endeavour. Engineers, would not be so blase in endeavours such as bridge building or aeroplane design. Medical researchers would not be so vague in evaluating new drug regimes or novel surgical intervention techniques. Therefore, it must be asked as to why applied psychology should allow itself to drift along on a relatively ad hoc trial and error basis, simply defended by the observation that traditional research methodology is inapplicable in an applied setting.

In essence, what applied psychologists require is a model or models for research and evaluation that will allow decisions to be made about intervention strategies on the basis of informed as opposed to mainly subjective judgement.

In this particular research project, the issues that appeared paramount for the researcher were as follows:

(a) The need to develop a strategy that will be applicable over an extended time scale.

(b) The need to develop a strategy that will take account of the varying spectrum of objectives that any intervention with learning disabled children may have.

(c) The need to develop a strategy that will take account of both the strengths and weaknesses of any given intervention.

(d) The need for a strategy that will provide psychologists and educators with relatively easily assimilable information on which to base decisions about policy options in the field of providing for children with learning difficulties. In a climate where resources are tight and demands for cost effectiveness are increasing, this issue becomes more and more important.

With these needs and issues in mind, it seems appropriate to consider alternative strategies for research design.

4. ALTERNATIVE APPROACHES TO PSYCHOLOGICAL/EDUCATIONAL RESEARCH

4.1 INTRODUCTION

As already noted, when the needs and objectives of the research being presented in this thesis were taken into account, conventional psychological research methodology was found somewhat wanting. Sensitivity both to the characteristics of the research, and to the contextual constraints upon it, demanded that alternative methodological approaches be considered. Cook and Shadish (1986) make the point that if evaluative research is to improve a given intervention programme, it must interact with that programme on the latter's terms, and not seek to impose quite unreasonable constraints on the programme in the name of a tight methodology. It would therefore seem appropriate to take an alternative view of methodological issues.

4.2 THEORETICAL CONSIDERATIONS

Differing theoretical perspectives agree on the fact that evaluation should lead to the most effective problem amelioration possible, but there are disagreements as to how this might be achieved in practice. In a recent review of the extensive literature in this area, Cook and Shadish (1986) identify three distinct theoretical positions. This organisation of the theoretical issues allows for the discussion of the substantive points in a particularly helpful manner, and can be adopted as a framework for looking at these issues.

4.2.1 MANIPULABLE SOLUTION

Such a position is seen in the work of Campbell (1969, 1971) and Scriven (1983), where they suggest that it is less important to know how and why a particular approach works, than it is to know

the extent to which it works. Thus, the emphasis is laid on consideration of multiple alternative solutions to a given problem, on the assumption that this will point towards the most effective solution. Cook and Shadish (1986) point out that this approach has fallen out of favour in recent times. Apart from the logistical, practical and economic problems of undertaking a variety of potential solutions in order to identify the most effective, there was no real evidence that such solutions - once identified - would be subsequently widely disseminated.

4.2.2 GENERALIZED EXPLANATION

This approach, which emphasises the general complexity of social processes, is exemplified in the work of such researchers as Cronbach (1982), Ross (1963, 1980), and Weiss (1977, 1978). Such an approach suggests that a knowledge of the complex interactions of various causative processes is necessary before generalisations can be made, and the findings from a sample study are transferred to other projects or situations. In effect, the emphasis here is on the belief that if any substantive theory underpinning a given intervention can be understood, then this will maximise the chances of understanding the processes and their subsequent consequences.

There are, however, some problems with this position. There is a requirement for the construction of highly complex social theoretical models. In practice, however, it may not always be possible to wait for the development of adequate theories, when the demands on the service and the practitioner to do something practical, are considerable. There is also a tendency to emphasise explanations

at the expense of description, which carries the risk of becoming bogged down in complex issues of cause and effect.

4.2.3 STAKEHOLDER SERVICE

Researchers such as Wholey (1983) and Patton (1978) typify the Stakeholder Service approach to evaluation. The essential feature of this perspective is that the needs of the relevant "stakeholders" associated with a given programme are paramount when evaluation is considered. The evaluation should provide useful information for those individuals, who may include the professionals working on the programme, the programme's clients, general administrators, or any other group of individuals with a valid claim.

In this instance, the evaluator takes on the role of educator and facilitator, while the stakeholders define the problem, and the nature of the planned programme. This approach very much assumes that those individuals with frequent contact with the client population, and the context of the problem, are in the best position to judge the efficacy of a given programme.

There are criticisms, however, made of this position. It is argued that in some instances the stakeholders may set trivial and self centred questions for evaluation, which may result in information which, though useful, may have peripheral relevance to the core of the problem. If not dealt with, this may further lead to misleading information which is incomplete. These difficulties may be dealt with by the researchers not necessarily restricting themselves to the questions defined by the stakeholders, but at times this may be problematical in terms of maintaining the balance of initial cooperation and trust between researchers and stakeholders.

4.3.4 SUMMARY

Although these three theoretical perspectives are descriptively separate, in reality much evaluation work will inevitably cross these artificial boundaries. For example, the stakeholder approach may have much in common with the manipulable solution approach, given a careful, informed and judicious choice of stakeholders, since their knowledge base is more likely to reflect general interests rather than narrow minded self interest. They do, however, provide a useful way forward in considering alternative methodological strategies.

4.3 GENERAL CONSIDERATIONS

In addition to the more theoretical considerations outlined above, there were other more general points that had to be borne in mind when considering methodological issues.

4.3.1 EVALUATION USAGE

Careful consideration has always to be given to the use that a particular evaluation is put to. Lindblom and Cohen (1979) point out that evaluation results are rarely used to justify the abandonment of a given programme totally, and that more often than not they will lead to dispute rather than consensus. More usually, evaluation findings will influence the internal priorities and features of a programme, resulting in change rather than wholesale abandonment. The pluralist conception of evaluation also stresses that in many instances the diverse interests associated with a given programme may seek to use the evaluation for their own ends, and that the evaluation strategy should try and take account of this.

At all times, every effort should be made to ensure that the results of the evaluation are made known to those individuals and organisations who are in a position to act effectively upon them, and to ensure that the results are presented in a way which is intelligible to these parties.

4.3.2 VALUE JUDGEMENTS IN EVALUATION

Most programmes which require evaluation have multiple components, the information on which requires to be synthesised into an overall result. Inevitably, these individual components will not all be perceived as having the same value and importance and it is therefore necessary for the evaluation to seek to take this into account. At the simplest level, the objectives of the programme can be used to determine where the heaviest emphasis should be placed. As Scriven (1983) points out, objectives are often vague and hidden, and the temptation exists to set excessively modest criteria for objective attainment, which may in turn lead to programme success being superficial and often transitory. There is also the added complication that programmes may have quite unintended and unexpected effects, and by focussing too narrowly on previously set criteria, these effects may be ignored totally, or their significance underestimated. More sophisticated methods need to be adopted in order to take account of the various components that make a contribution to the given programme. The approach described by Edwards, Guttentag and Snapper (1975) goes some way towards addressing some of these issues. By providing a framework against which objectives can be prioritized and valued, it encourages bringing all the objectives out into the open, thus minimising the possibility of unstated covert objectives contaminating

the outcome. It also provides an overall synthesis of the information that may be used to ascertain programme usefulness. However, it is worth cautioning that while an overall synthesis may be compatible with a desire for simple answers to complex problems, individual findings within an evaluation should be retained, so that other unique syntheses may be created if necessary.

4.4 THE STRATEGY ADOPTED - A RATIONALE

Before considering the methodology adopted in this study in the light of the comments made above regarding theoretical and general considerations, it would be useful to summarise, once again, the needs of the research programme that was being carried out.

4.4.1 NEEDS OF THE RESEARCH PROGRAMME

1. There was an identified need to compare various programmes of intervention in order to provide information that would be of use for decision making purposes.
2. It was recognised as important to consider the needs of the various groups or stakeholders that would have an interest in the outcome of the programme.
   Eg.: Psychologists; Teachers; Administrators; Parents; Children.
3. There was a need to take into account the heterogeneous nature of the clients involved.
4. Finally, it was recognised that there would be a variety of objectives that the programmes would have to address.

In view of both the theoretical and general considerations outlined above, and also with reference to the needs of the study, it was decided to adapt the Decision Theoretic Approach as described by Edwards, Guttentag and Snapper (1975). The details of the approach are outlined in the Appendix to this chapter, but at this juncture, it is necessary to place the Decision Theoretic Approach in the context of the theoretical and general issues that have been raised.

4.4.2 THE DECISION THEORETIC APPROACH AND THEORETICAL CONSIDERATIONS

When considering the needs of the study against the theoretical framework described by Cook and Shadish (1986), it is clear that the evaluation should reflect the Manipulable Solution Approach, as there is a need to know the extent to which various strategies work, rather than simply how or why they work. There are also elements of the Stakeholder Approach, as there is a need to provide evaluative data that may be of use to various relevant stakeholders involved in the whole process.

The Decision Theoretic Approach seemed appropriate in this instance, as it both allows for the views and interests of various parties to be considered, while at the same time providing a methodology which will give a synthesised measure of utility of the strategies being used. As the approach is applicable to single subjects or to large numbers of subjects, it can also be sensitive to the heterogeneous nature of the individuals concerned, and to the fact that this has to be taken into consideration. The evaluated outcome does not require the creation of a control group, which is impossible to achieve in a 'field' study such as the present one.

4.4.3 THE DECISION THEORETIC APPROACH AND EVALUATION USAGE

The extent to which the Decision Theoretic Approach may facilitate the actual uptake of the evaluation outcome also warrants some consideration. It can be argued that the approach does increase the likelihood that the outcome will be taken account of for the following reasons:

1. At all crucial points in the process, the active participation of representatives of these parties most open to persuasion by the outcome results is encouraged, and to some extent this gives the stakeholder groups some sense of participation in the overall process, which may increase the likelihood that outcome results will be taken note of.

2. The utility measure provided by the Decision Theoretic Approach gives a synthesis of outcome which takes account of both the strengths and the weaknesses of each strategy in a balanced and coherent manner. Thus, it is to be hoped that the relative accessibility of such a measure is likely to increase its influence with potential decision makers.

4.4.4 THE DECISION THEORETIC APPROACH AND VALUE JUDGEMENTS

One of the cornerstones of the Decision Theoretic Approach as described by Edwards, Guttentag and Snapper (1975), is the emphasis on prioritizing and weighting the objectives under consideration. Not only does it provide a method of valuing the positive attributes that a given strategy brings to tackling the objectives set, it also will allow for any weaknesses that the strategy has in tackling the same objectives to be taken into account.

Thus, any consumer of the results of such an evaluation will have ready access to information regarding the differential values placed on the objectives, which should in itself, increase the likelihood that the evaluation will be seen as a fair and valid attempt to give a balanced view of the programme, and not merely a focus on obvious benefits. Again, it may be argued that this will increase the chances that the evaluation will receive due and appropriate attention.

4.4.5 THE DECISION THEORETIC APPROACH AND OTHER ISSUES SPECIFIC TO THIS STUDY

In addition to the points outlined above, which provide a rationale for the use of the Decision Theoretic Approach, there are often more specifically pragmatic factors relating to this study which have reinforced the use of this methodological approach.

1. Applicability of the Methodology

   There was seen to be a need to adopt a methodology which is readily explicable to, and usable by, a broad range of individuals who would be involved in seeking to evaluate not only these programmes, but also other programmes at some point in the future. Although, at first sight, the procedures involved may have seemed complex, the steps are relatively easily explained, and potentially assimilable by a variety of professionals.

2. Spread of Evaluation Burden

   Although any evaluation needs to be centrally coordinated, there is nevertheless value in having a methodology, like the Decision Theoretic Approach, which has the potential to spread the burden of the evaluation work across a range of individuals. At each

stage in the process work load can be shared, and this hopefully may avoid the problems of a methodology which, in demanding too much of a few individuals, runs the risk of failing through lack of time and waning commitment.

3. Range of Outcome Presentation

The outcome of the evaluation in this instance had to meet the dual needs of those who wished a general overview of outcome in order to make general decisions regarding policy and resource allocation, and the needs of those who were more intimately involved with the process of programme implementation, and who therefore needed more detailed access to information about aspects of the programme, in order to facilitate change as appropriate. The Decision Theoretic Methodology provides for both of these possibilities.

4. Continuous Assessment Methodology

The nature of the work being carried out in this project was such that the intervention was longitudinal in nature, and as such there was a need for a methodology which would 'grow' along with the programme. The ability of the Decision Theoretic Approach to revise utility values in the light of on going experience, was a particularly attractive feature of the methodology. The evaluation was therefore more than a series of "snapshots" in time, it allowed for a rolling accumulation of evaluative data.

4.5 CONCLUSIONS

It may well be that there are other strategies and methodolgies which could have been adopted in this instance, but in terms of the

theoretical, general, and practical issues involved, the Decision Theoretic Approach seems to acquit itself well, and justifies its adoption. At a more practical level, the procedures associated with the Decision Theoretic Approach are well documented in the paper by Edwards, Guttentag and Snapper (1975), and the steps involved lend themselves to the minor adaptations required to meet the specific needs of this study.

CHAPTER FOUR.

CHAPTER FOUR.

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METHOD SECTION

1. INTRODUCTION

When considering the methods adopted in this study, it is important to bear in mind the longitudinal and complex nature of the research. To put the process in context, it is necessary to consider three distinct phases, as follows:

1. Preliminary Work

   The Decision Theoretic methodology requires that an appropriate framework has to be created before the study can be made operational. This phase will be considered under this heading.

2. Assessment Phase

   In this section, various assessment strategies were carried out and evaluated.

3. Intervention Phase

   In this section, three intervention strategies were adopted, and their outcomes over time were considered and evaluated.

The procedures followed in each of the three sections constitute a separate, but ultimately integral description of the whole research process.

Footnote:

Considerable reference will be made throughout these sections to various forms and inventories. Full details of all such material are provided in full in the appendix to this chapter.

2. PRELIMINARY PHASE

2.1 INTRODUCTION

The Decision Theoretic methodology required that objectives be set which would then be rated and weighted. It was necessary to do this prior to the formal instigation of the project.

2.2 OBJECTIVE SETTING

The first task to be addressed was to consider the basic question:

> "What objectives would be considered important when undertaking remedial intervention with a child who presents as having a significant specific learning difficulty?"

Within an educational context there are various assumptions - some explicit, others implicit - about the criteria that may be adopted to describe a given child as having a learning difficulty, and also what subsequent objectives may be addressed when dealing with the problem.

It was the intention of this piece of research to ensure, as far as that were possible, that conventional practice within Educational Psychology be adhered to. The parameters of resources were borne in mind at all times. In addressing the basic question about objectives, it was the intention to firm up explicit objectives and to bring implicit objectives out into the open.

2.3 SEEKING CONSENSUS

Within the educational context, there are various professionals who have a legitimate opinion regarding answering the question about the objectives:

a. Class Teachers

b. Remedial Specialist Teachers

c. Educational Psychologists

d. University or College Lecturers in Education

With these professional groups in mind, the Decision Theoretic Approach demands that a consensus regarding the question being asked should be reached. This was achieved by the organisation of a working party consisting of representatives of the above professional groups, who were given the remit of addressing the question of the objectives.

2.3.1 WORKING PARTY MEMBERSHIP

The persons in the Working Party were approached by the author. Before the nature of the specific task was outlined, they were informed that this would form part of an overall research project, and that one of the strategies under consideration was being specifically considered by the author. None of the persons approached had either heard of the Multimodal approach or had any awareness at all of Lazarus' work. In no way was any member of the Working Party knowingly sympathetic towards any of the strategies that were considered, especially towards the Multimodal strategy. All the persons serving on the Working Party gave up their professional time freely, and of their own accord, agreeing that the issue in general was an important one, regardless of any specific research requirements.

The Working Party consisted of the following members:

1. Primary School Headteachers - Two in number

   One headteacher has a complete non-teaching role within the school. The remit here consisted of the organisation of

general educational provision to all children in a large urban primary school. The school had a significant percentage of its children with learning problems of one kind or another.

The second headteacher had a part-time teaching commitment in a smaller, more rural school, and in the absence of remedial provision in the school, provided extra support for children with learning difficulties as they arose.

2. Primary Trained Remedial Specialist Teacher - One in number

This teacher had an extra qualification in dealing with children with learning difficulties. The teacher's professional time was divided between providing peripatetic support for schools and teachers in order to help them deal with learning difficulties in their schools, and in providing small group and individual support for children with learning difficulties within the context of a Child Guidance Centre.

3. Educational Psychologists - Three in number

Two of the psychologists dealt with children referred from schools, who had a variety of learning problems, as part of their generic role within a Child Guidance Service. The third psychologist specialised in the problems of such children, and had the specific remit of organising and running a Child Guidance Centre based unit for the support of such children.

4. College Lecturer - One in number

The lecturer had a background in both psychology and education, and worked in the Department of Special Educational Needs in a

major Scottish College of Education. The lecturer carried a specific research interest in children with special needs in mainstream schools.

The sex balance of the Working Party was four women and three men. In addition, the author convened the meetings of the Working Party and acted as minutes secretary.

2.3.2 WORKING PARTY REMIT

The Working Party was charged with the remit of specifying the objectives that would flow from the question set at the beginning of Section 2.2.

The Working Party met on three separate occasions in order to conclude their deliberations and specify the objectives. The following procedures pertained in each of the three meetings.

1. The author convened the meetings, and arranged for notification to be made to all members.

2. The author acted as a minute secretary at all three meetings, and his role was confined to this purely.

3. After each meeting, minutes were circulated to all Working Party members, and had to be agreed by all before being adopted.

4. The Working Party appointed their own Chairperson, and the format of the meetings was dictated by the Working Party members through the Chairperson.

2.4 WORKING PARTY DELIBERATIONS

It is not the intention to give detailed notes of the step by step deliberations of the Working Party in this thesis, although such notes and minutes are available.

2.4.1 SETTING OBJECTIVES

The first meeting of the Working Party spent considerable time in general discussion of the remit. Their first major decision was to specify what they considered would constitute a child with "significant specific learning difficulties".

The following points were considered important:

- Children who were having difficulties because of the fact that they were slow learners who were nonetheless working to their potential, were excluded from consideration.
- While accepting that a child may have a spectrum of various difficulties, it was decided that reading problems should be central to considerations in all instances.

Taking account of the above points the Working Party decided that children falling into the category under consideration should:

> Be of average or above intellectual potential - IQ = 90+ - and have a minimum of 2 years' retardation on a standardised reading test.

Having clarified their thinking on the population of children under consideration, the Working Party then were able to set preliminary objectives for future consideration.

The second meeting of the Working Party spent its time clarifying and refining the preliminary objectives set at the first meeting. It also emerged at this second meeting that objectives should be considered in terms of two distinct phases existing in any strategy:

- An Assessment Phase
- An Intervention Phase

At the third and final meeting of the Working Party, the final set of objectives was drawn up and agreed upon. The final objectives list which then went forward to form the basis of the subsequent research programme was as follows:

Any remedial intervention programme designed to help a child with significant learning difficulties should seek to address the following objectives:

1. The programme should seek information about the child's functioning from a variety of different, yet relevant sources.
2. The assessment should be of a continuous and on-going nature, which would allow the programme to be flexible - allowing for feedback that leads to monitored change, where necessary.
3. Information should be gathered about environmental and social factors that may influence the child's functioning.
4. Any intervention should be cost effective and an efficient use of limited resources, and the assessment should also take account of this.

5. The programme should elicit a profile of the child's strengths and weaknesses in the cognitive area, the affective area, and the physical area.
6. The programme should seek to improve the child's attainments and mastery in reading.
7. The programme should seek to improve the child's perception of the value of reading, their motivation to read, and their self confidence in reading.
8. The programme should involve a clearly stated intervention that would allow for the practice and consolidation of the skills taught in the remedial setting, into the whole area of school life.
9. The programme should involve a clearly stated intervention that would allow for the practice and consolidation of the skills taught in the remedial setting, into the home setting.
10. The programme should be such that it allows for varying degrees and intensities of intervention.

2.5 RATING AND WEIGHTING OF THE OBJECTIVES

Once the objectives had been set, the next task in the preliminary work was to have the objectives arranged hierarchically, and then weighted in terms of importance.

2.5.1 INTRODUCTION

There were two possible strategies that could have been adopted in order to rate and weight the objectives:

1. The task could have been added to the remit of the original Working Party, and that forum again used to seek consensus. Alternatively, a separate Working Party could have been commissioned with rating and weighting of the objectives as their remit.

2. A sampling of individual opinion could be taken across various professional groups with an interest in the issue, and a consensus achieved by averaging.

The first strategy was rejected on basic pragmatic grounds. The members of the original Working Party had freely given of their time and efforts in setting the objectives, and had made it clear they did not wish to commit themselves to a further task. The setting up of a separate Working Party was also rejected. The time factor was a major issue here. The original Working Party had taken five months from first meeting to conclusion, and there was no reason to suppose that the new task would take any less time to achieve given a new group of people. In addition to this, the extra commitment on fellow professionals was not felt to be fair by the author, in light of the on-going demands on the services they provide.

Consequently, it was decided to adopt the second strategy. In order to broaden the potential interest flowing from the data, it was decided to seek the opinions of three distinct groups:

1. Educational Psychologists

   This group has a natural on-going interest in the issue of children with learning difficulties, and what strategies might be adopted for them.

2. Practising Primary Teachers

   This group represents the natural focus for identifying initially, and having to deal with, children with learning difficulties. The demands on the class teacher are varied, and they obviously had a considerable interest in how to work with such difficult children.

3. Student Teachers - Taking Remedial Option

   It was felt that it might prove an interesting contrast to consider the opinions of final year student teachers, who had access to the theory, but lacked the on-job experience. In addition, the group selected were taking remedial and Special Education as their preferred final year option.

2.5.2 METHOD

Each professional or student approached was issued with an explanatory sheet, (see Chapter Appendix), which outlined the nature of the task, and gave a simple worked example.

In the case of the Educational Psychologists and the Practising Teachers, the initial contact was made at a one-to-one personal level,

and they were then left to complete the task. When problems arose, they were encouraged to contact the researcher in order to clarify the point of confusion. In the case of the Student Teachers, contact was made via the auspices of a College of Education, and at the request of the College they were seen as a class group. The task was completed by the students as an "in-class" exercise, with the researcher being on hand to clear up any misunderstandings as they arose.

In all, 8 Educational Psychologists, 7 Practising Teachers, and 8 Student Teachers completed the task.

At the end of the task each individual had rated each of the objectives in a hierarchical order in terms of perceived importance, and had subsequently weighted each objective as described in the instructions - see Chapter Appendix. Thus, not only was there a hierarchial rating of the objectives, there was also a measure of the relative importance of the objectives within that overall hierarchy.

2.6 ESTABLISHING PRIOR PROBABILITIES

2.6.1 INTRODUCTION

This stage of the preliminary work focussed on setting Prior Probabilities that each objective in turn would be met by any given strategy.

The research examined three separate strategies - one the Multimodal approach, and two different strategies existing within Child Guidance Services.

1. Strategy A - Child Guidance Service 1

   In this particular Child Guidance Service, there was a very structured and centralised approach to dealing with children with learning difficulties. The admissions procedure, remediation procedure and review procedures were of a very standard format. This strategy was described as Structured and Centralised Model (SCM).

2. Strategy B - Child Guidance Service 2

   In this particular Child Guidance Service, the practice with children identified as having significant learning difficulties varied in a rather ad hoc fashion depending on the case psychologist, and the approaches adopted in a given Centre. This strategy was described as Unstructured and De-Centralised Model (UDM).

3. Multimodal Strategy

   The third approach was the Multimodal approach based on Lazarus' work as described previously. This strategy was simply described

as the Multimodal Model (MM).

2.6.2 DESCRIPTION OF EACH STRATEGY MODEL

Obtaining the prior probabilities required making subjective judgements about the extent to which each of the objectives in turn was likely to be met by each of the strategies in turn.

The first stage in this process involved preparing summarised descriptions of what was involved in each of the three strategy models. In the case of the SCM and the UDM strategies, the summarised descriptions were circulated around staff in the Services, and only used in the study once there was agreement that the description was a fair reflection of the practice in the service. In the case of the MM strategy, the description represented a brief factual description of the Multimodal approach, and how this was to be used to build the intervention.

The summarised descriptions of the three strategies are given in the Appendix to this Chapter.

2.6.3 OBTAINING PRIOR SUBJECTIVE PROBABILITIES

The same individuals who had been involved in setting the weightings for the objectives were asked again to complete this task - 8 Psychologists; 7 Practising Teachers; 8 Student Teachers.

The task was completed separately and at a later date, than the original weighting task. In the case of the psychologists and the teachers the task was explained and completed on an individual level. The student teachers again completed the task in a group setting in College.

Footnote:

At no time did the researcher seek to influence the individual respondents' opinions. Any advice given merely focused on the mechanics of the methodology.

Each individual was given three separate sets of information.

1. The summarised descriptions of the three strategy models.
2. An explanatory sheet which set out the task, and gave a worked example.
3. A record sheet on which to record their opinions.

Note: The relevant sheets are given in the Appendix to the Chapter.

Verbal explanation was also given which served to reinforce the instructions on the explanatory sheet.

Each individual then proceeded to record their own individual prior subjective probabilities, that each objective would be met in turn by each of the three strategies.

2.6.4 OBTAINING PRIOR SUBJECTIVE UTILITY MEASURES

The 10 objectives could be clearly differentiated into 5 that related to the Assessment Phase of the programme, and 5 that related to the Intervention Phase of the programme. It was therefore decided to consider separately the utilities that a strategy has to meet the assessment objectives on the one hand, and the intervention objectives on the other hand.

For each of the individuals who completed the probability task, it was possible to compute the utility value for both the assessment and the intervention phase using the methodology described by Edwards, Guttentag and Snapper (1975) - see Appendix to the Chapter for details.

Thus there were appropriate utility values for the psychologists, the teachers, and the student teachers. Medium utility values for each professional group could also be calculated.

2.6.5. Global and Refined Utilities

In order to attempt to achieve a greater depth of analysis of the objectives, it was observed that certain among lend themselves to potential sub-division. Of the original objectives, 4, 5, 6 and 7 lent themselves to being broken down into sub-objectives. the details of this sub-division is shown on the Assessment and Intervention questionnaires which are set out in full in the Appendix.

The utilities were calculated using:

1. The overall judgements about the 10 objectives -Global Utility Values
2. The judgements about the sub-division objectives, as appropriate
   - Refined Utility Values

These Global and Refined utilities were calculated using the following objectives:

(a) Assessment Phase

Global: 1,2,3,4(D),5(T)

Refined: 1.2.3.4(D),5(A),5(B),5(C).

(b) Intervention Phase

Global: 4(T),6(T),7(T),8,9,10

Refined: 4(A),4(B),4(C),6(A),6(B),7(A),7(B),7(C),8,9,10.

This comparison was made in order to ascertain whether such a refinement would lead to a more insightful level of data analysis.

2.6.6. Conclusion

At the end of this preliminary stage it was therefore possible to give Prior Subjective Utility Values for both the assessment and the intervention phase of each strategy, from the point of view of these three different groups - pyschologists, teachers, student teachers. These utility values gave a measure of the apparent usefulness of each of the three strategies from the prospective of the three differing, but interested groups. These were based on the broadly factual statements of the intended format of each of the three strategies.

3. ASSESSMENT PHASE

3.1 INTRODUCTION

As has been pointed out in the previous section, objectives - appropriately weighted - had been set, and prior subjective utility values for both the assessment phase and the intervention phase had been calculated for the three strategies under consideration - SCM; UDM; MM.

The second stage of the study involved gathering data from actual assessments undertaken in each of the three strategies, in order to revise the initial subjective utility values in the light of experience. As will be shown, the methodology allowed for opinions to be reached regarding the actual assessments undertaken, which would then be used in conjunction with the original weightings to give posterior utility values for the assessments.

3.2 DATA GATHERING

For each of the three strategies considered, data was collected for 6 subjects - making 18 subjects in all.

Footnote:

In conventional methodological terms, 18 subjects may not seem a lot, but it has to be remembered that at any given point in time there are not large numbers of such subjects meeting the criteria set, who are referred to Child Guidance Services. As was pointed out previously, this was one of the reasons for adopting the actual methodology used.

The assessment data gathered in each case consisted of:

1. The case psychologist's assessment report prepared to promote the referral for extra specialist support for the child with learning difficulties.

2. A structured questionnaire which gave further supplementary information about the whole assessment process.
   (Questionnaire detailed in the Appendix to this Chapter.)

The information contained in the psychologist's report included the data considered important and relevant by the case psychologist, which the staff - teaching or otherwise - would require access to in dealing appropriately with the child. The structured questionnaires were completed by the psychologist responsible for the child while under the management of the special unit provision. This may or may not be the case psychologist, depending on the practice within a given Child Guidance Service.

3.3 DATA EVALUATION

The assessment data collected had to be evaluated in a manner which was meaningful vis a vis the objectives that had previously been set. This was done in the following manner:

1. Six "Expert Judges" were approached, and asked if they would be prepared to consider some assessment information on children with specific learning difficulties, and to fill out a questionnaire relating to the assessment objectives. The six "Expert Judges" were:

(a) Two College of Education Lecturers - specialising in children with Special Educational Needs.

(b) Three Educational Psychologists who had a specialism in children with learning difficulties. All of the psychologists worked in Child Guidance Services other than the ones the subjects in the study were from.

(c) One Primary Teacher working outwith any of the areas the subjects came from.

2. Each "Expert Judge" received the data on the assessment of each of the 18 subjects. The data was presented anonymously with no information suggesting geographical area or which strategy the child was being potentially assessed for.

They were also given a questionnaire to fill out for each of the 18 subjects which asked them to assign a probability that the assessment - as presented - met each of the assessment objectives in turn.
(The questionnaire is given in full in the Appendix to this Chapter.)

The assessment information was presented anonymously, and there was no indication, other than the natural format of the assessment data as to which of three strategies being used, the subject came from.

3.4. POSTERIOR UTILITY VALUES

For each of the 18 subjects there were, thus, 6 sets of opinions regarding the extent of which the assessments were carried out had met the given objectives.

Using the original weightings which were produced in the preliminary stages of the study, it was possible to calculate utility values in the same manner as before for each subject, based on the returns from each of the 6 "Expert Judges" in turn.

Median utility values were calculated for the subjects from the three strategies - SMC,UDM,MM - using the weightings derived from:

(a) the psychologists

(b) the teachers

(c) the student teachers.

Details and sample calculations for obtaining these median utility values is given in the Appendix.

It was then possible to make comparisons with the corresponding data from the prior subjective phase of the study in order to provide a comparison of how the three strategies had done in reality, compared with how they had potentially presented themselves.

3.5. OTHER ASSESSMENT INFORMATION

In addition to the probability values, each of the "Expert Judges" were invited to make comments on their questionnaire regarding

various specific questions that were asked about the assessment information given. In the majority of cases such qualitative comments were provided. It was hoped that such comments would enrich the overall view of the assessments.

3.6 CONCLUSION

Using the Decision Theoretic Methodology, it was thus possible to make comparisons in terms of the assessments between what each of the three strategies appeared to offer, and what each actually offered in reality.

4. INTERVENTION PHASE

4.1 INTRODUCTION

As was pointed out in the preliminary work section, objectives - appropriately weighted - had been set, and prior subjective utility values for the intervention phase had been calculated for the three strategies under consideration - SCM; UDM; MM.

This third stage of the study involved following up on subjects during the time spent receiving extra specialist support for their specific learning difficulties under one or other of the three strategies. It was the intention that the subjective utilities should be revised in the light of information being collected from the field work.

4.2 DATA GATHERING

For each of the three strategies considered, data was collected as follows:

SCM : 5 subjects followed up

UDM : 5 subjects followed up

MM : 4 subjects followed up

It will be noted that in the assessment phase there were 6 subjects in each of the three strategy conditions. The reason for the subject reductions were as follows:

In both the SCM and the UDM strategies one of the subjects whose assessment profile was considered came to the end of their intervention programme before the study got fully under way. In the MM strategy one of the subjects withdrew from the programme initially devised through the multimodal assessment due to parental

wishes, and another subject moved out of the district. It should be pointed out that the methodology being employed is such that accommodations resulting from such unforseen factors can be made.

Data on each subject was gathered at two distinct points:

1. At the point of entry into the specialist support unit - ostensibly the subject's "starting" condition.

2. At some organisationally appropriate point in the future, not less than 6 months and not more than 8 months further on.

Footnote:

Not all the subjects entered their programmes at the same point in time, and consequently the most appropriate point at which to carry out follow up data gathering varied from subject to subject, but fell within the limits indicated - unless a long vacation (eg. summer) intervened when no intervention was being undertaken.

The data gathered consisted of the following:

1. The psychologist's assessment report - initial data only.
2. Psychometric details of the child as deemed appropriate in each strategy.
3. Structured parental interview.
4. Structured teacher interview.

Note: The format of the structured interviews of 3 and 4 are given in the Appendix to this Chapter.

Data from points 2, 3 and 4 was collected at both the beginning and the end of the period of intervention under consideration.

In the first instance the structured interview questionnaires were carried out by the researcher with the Class Teacher, the Head Teacher and the parent(s). In each case, the researcher asked if they would be willing to complete a follow up questionnaire of exactly the same format at some point in the future. In all instances, they agreed to do so, and it was explained that these would be sent by post with a stamped addressed envelope for easy return.

Follow up psychometric data was obtained by whomever would normally be engaged in doing so. This may be the case psychologist, the unit psychologist or perhaps the specialist teacher working in the unit.

During the period under consideration, each subject would be receiving the remedial and other support as delineated by the programme flowing from the strategy.

4.3 DATA EVALUATION

The methodology for evaluating the collected data was broadly similar to that used during the assessment phase. There were, however, some differences of detail.

The "Expert Judges" used were the same as in the assessment phase. However, during the assessment phase they had reported that they had found the time commitment involved in the task very onerous. The feeling among the group of "Expert Judges" was that they would wish to support the project, but realistically this would require scaling down the demands made of each one. It was finally agreed with the "Expert Judges" that each would evaluate seven subjects during this intervention phase, thus reducing their burden by half. A system of staggered and random allocation of subjects to "Expert Judges" was adopted to ensure that each subject was evaluated by three of the six judges.

For each subject the starting and finishing information was summarised in a manner that made comparisons easy for the "Expert Judge". The summarised information was presented in the following areas:

1. Starting and finishing psychometric details.
2. Starting and finishing parental comments.
3. Starting and finishing teacher comments.

Note: Details of the summary sheets are presented in the Appendix to this Chapter.

The "Expert Judge" was furnished with:

1. The set of summary record sheets outlined above for each subject they were evaluating.

2. An Intervention Questionnaire. This questionnaire was based on the same format as that used in the Assessment Phase, and asked the judge to assign a probability that the intervention data - as presented - met each of the intervention objectives in turn.

Note: The intervention questionnaire is given in full in the Appendix to this Chapter.

The subject information was anonymous, and there was no indication as to which of the three strategies being used, the subject came from.

4.4 POSTERIOR UTILITY VALUES

For each of the 14 subjects there were opinions from the "Expert Judges" regarding the extent to which the intervention had met the given objectives.

Taking the original weightings used in the prior subjective utility calculations, it was possible to evaluate utilities for each subject based on the probability returns from the judges.

Median utility values were calculated for the subjects from the three strategies - SCM,UDM,MM - using the weightings derived from:

(a) the psychologists
(b) the teachers
(c) the student teachers

Again, details and sample calculations are given in the Appendix.

It was then possible to make comparisons with the corresponding data from the prior subjective phase of the study, in order to provide a comparison of how the three strategies had done in terms of their interventions, compared with how they had potentially presented themselves.

4.5 SECOND RUN EVALUATION

In order to provide further data about the progress of the subjects over a longer time span, the whole process was repeated using the finishing data from the initial run as the starting data for the second run. In effect, all the subjects were naturally continuing in their programmes of intervention after the initial sets of data gathering exercises. Thus, it was logical to continue to follow their progress for another 6 to 8 months. At the end of this second run, new finishing data was gathered as before. Using the identical procedures as outlined above for the first run, the intervention utility values for each subject were further revised.

The period of the study covering the first and second run was judged to be enough on which to base an assessment of the different strategies, even if repetition of the procedure at later times might

have provided further confirmation of the results obtained. The ability of the methodology to accommodate to as many revisions of the utility values as the researcher may wish, is clearly a major advantage in that, in priciple, it does not limit the intervention to any pre-determined time scale.

5. CONCLUSIONS ON METHOD

The method as outlined in this section of the study is an attempt to tie together the complex and interactive processes involved when 14 separate and autonomous subjects are brought into highly specific settings for programmes of intervention ostensibly designed to meet their unique profile of needs. The methodology adopted allowed for each child to be considered at face value, without having to pay heed to the artificial demands of a more traditional experimental model.

The difficulties, as well as the advantages, of this methodology will be discussed in greater detail at a later point in the thesis.

CHAPTER FIVE.

CHAPTER FIVE.

RESULTS AND CONCLUSIONS.

Results and Conclusions.

1. Introduction.

The research reported in this thesis has two themes which are under consideration. One major theme is the relative effectiveness of the three strategies represented in the study as a means of helping children with learning difficulties. More especially, the interest was focussed as the effectiveness of Lazarus' Multimodal paradigm as a framework for facilitating valid and constructive intervention. The study considered both the assessment phase and the intervention phase of the strategies, and the methodology sought to provide information about these aspects of the three strategies in a manner that would hopefully facilitate informed decision making by those most directly involved in planning interventions.

The second theme which will be considered relates to the methodology used in this study. It was an adaptation of a methodology employed on a much larger scale regarding social policy decision making. It was of interest the extent to which this adaptation potentially provided a methodology which would be both valid and useful in an applied educational context.

Finally it was expected that the study would throw up other useful and important questions that would justify further research.

2. Objective Weightings.

2.1 Introduction.

At the preliminary stage of the study it was required that the objectives of assessment and intervention be set, and that these

objectives be subsequently rated hierarchically and weighted in terms of their perceived importance. This, as may be recalled, was done by three distinct groups:

1. Psychologists (N = 8)
2. Teachers (N = 7)
3. Student Teachers (N = 8)

In the first instance we can look at the weightings assigned to each of the objectives by the members of the three groups, the weightings being scaled in order to minimise the influence of aberrant judges. Raw weightings and details of the scaling procedure are given in the Appendix.

2.2 Weightings.

2.2.1 Psychologists

(a)

		PSYCHOLOGIST (P)							
		P1	P2	P3	P4	P5	P6	P7	P8
	1	4.8	19.7	18.8	7.6	5.7	2·0	6.7	3.2
* O	2	17.6	39.3	18.8	17.2	3·8	18·0	13.3	6.3
B	3	1.8	9.8	3.9	7.9	2.8	2·0	13.3	3.2
J	4	7.1	1.1	3.9	19.0	28.5	3·0	1.5	9.5
E C	5	22.9	0.5	9.4	10.3	2.3	3·0	4.4	6.3
T	6	14.2	1.1	7.9	3.4	14.2	9·0	4.4	17.0
I	7	3.5	3.3	18.8	6.9	23.7	36·0	26.7	17.0
V E	8	7.1	4.9	7.9	5.2	9.5	18·0	13.3	17.0
	9	3.5	0.5	7.9	5.2	7.6	3·0	13.3	14.2
	10	17.6	19.7	2.6	17.2	1.9	6·0	3.0	6.3

Table 1.

* Note: The Objectives identified in these tables by number 1 - 10, are as outlined in the objective list on page 410

(b) Psychologist's Perception of the Least and Most Important Objectives.

PSYCHOLOGIST (P)

	P1	P2	P3	P4	P5	P6	P7	P8
Least Important Objective(s)	3	5,9	10	6	10	1,3	4	1,3
Most Important Objective(s)	5	2	1 2 7	4	4	7	7	6 7 8

Table 2.

Note: In Tables 2, 4 & 6, when more than one Objective appears in the cell this indicates that more than one shared this position.

2.2.2 Teachers.

(a) Weightings.

		TEACHERS (T)						
		T1	T2	T3	T4	T5	T6	T7
	1	5·0	8.1	28.2	29.4	3.6	4.9	2.4
O	2	11·7	19.5	12.5	12.6	20.5	8.3	14.6
B	3	3·3	6.5	18.8	19.6	4.6	4.9	7.3
J	4	3·3	3.3	1.5	1.6	0.9	4.0	11.0
E	5	6·7	8.1	18.8	15.2	9.1	6.6	2.4
C	6	23·3	6.5	3.1	2.8	20.5	23.2	21.9
T	7	23·3	29.3	2·7	4.3	20.5	23.2	21.9
I	8	10·0	9.8	6.3	6.3	13.7	11.6	3.6
V	9	8·3	4.9	6.3	6.3	4.6	9.9	3.6
E	10	5·0	3.9	1.8	1.9	1.8	3.3	11.0

Table 3.

(b) Teacher's Perception of Least and Most Important Objectives.

	TEACHER (T)						
	T1	T2	T3	T4	T5	T6	T7
Least Important Objective(s)	3 4	4	4	4	4	10	1 5
Most Important Objective(s)	6 7	7	1	1	2, 6, 7	6 7	6 7

Table 4.

2.2.3 Student Teachers.

(a) Weightings.

STUDENT TEACHER(S)

OBJECTIVE	S1	S2	S3	S4	S5	S6	S7	S8
1	3.9	6.6	2.8	7.8	18.1	12.9	9.8	15.0
2	17.5	9.8	4.2	17.3	6.0	4.3	3.5	22.5
3	11.6	9.8	12.7	11.6	18.1	12.9	19.5	15.0
4	1.0	4.4	1.4	7.8	0.6	8.6	6.5	2.5
5	17.5	2.2	25.4	17.3	18.1	12.9	9.8	7.5
6	3.9	29.7	12.7	3.5	12.0	17.1	26.0	5.0
7	35.0	19.7	25.4	26.0	18.1	17.1	13.0	5.0
8	5.8	9.8	6.3	5.2	3.4	2.9	5.4	10.0
9	1.9	1.5	6.3	1.7	1.7	8.6	4.3	10.0
10	1.9	6.6	2.8	1.7	4.0	2.9	2.2	7.5

Table 5.

(b) Student Teachers Perception of Least and Most Important Objectives.

STUDENT TEACHER(S)

	S1	S2	S3	S4	S5	S6	S7	S8
Least Important Objective(s)	4	9	4	9 10	4	8 10	10	4
Most Important Objective	7	6	5 7	7	1 3 5 7	6 7	6	2

Table 6.

2.2.4 Intra-group Concordance of Judges Ratings.

In order to obtain some measure of the extent to which each of the three groups of judges were consistent in their perceptions of the Objectives, Kendall's Coefficient of Concordance (W) was calculated, and the appropriate Chi Square Value ($\dot{X}^2$) subsequently derived. These results are presented in Table 7.

JUDGES	W	X^2	df	p
PSYCHOLOGISTS	0·134	9·619	9	N.S.
TEACHERS	0·417	26·271	9	< 0·01
STUDENT TEACHERS	0·464	33·42	9	<0.001

Table 7.

2.3 Discussion of Weightings Data.

The weighting data is a pre-requisite for the main part of the study, and there are some points which emerge from looking at this data in itself.

2.3.1 Perception of Objectives.

Reviewing the data presented in Tables 2, 4 and 6, gives an indication of the kinds of objectives considered most and least important by the three groups of judges.

(a) Least Important Objectives.

The greatest homogeneity of opinion in this case is found in the Teacher's opinions. Objective 4 - which relates to cost effectiveness and the efficient use of limited resources - is dominant, and this is also the case with the Student Teachers, although to a lesser extent. The Psychologists on the other hand,

present with a much more heterogeneous mixture of opinions, and the issue of cost effectiveness is only considered relatively unimportant in one instance.

This pattern is perhaps to be expected. Teachers operate in a relatively closed system where issues of cost effectiveness and use of resources is generally a minor issue in terms of dealing with children in a class. Psychologists however, very often found themselves having to face up to the reality of finite and limited resources in a whole range of contexts, and often have to make recommendations where such issues play an important role.

(b) Most Important Objectives.

Not surprisingly, Objectives 6 & 7, which relate directly to improving all aspects of the child's reading, are generally seen by all three groups as being the most important objectives. Again, the Teachers are most uniform in their opinions here, and the Psychologists show the greatest variations. Interestingly, two of the Psychologists considered Objective 4 - relating to cost effectiveness - as being the most important, which would reinforce the comments made in (a) above, pointing again to the sensitivity the psychologists would have for this ussue.

2.3.2 Internal Consistency.

Consideration of the 'p' values for the Chi Square presented in Table 7 demonstrates that there is a highly significant measure of agreement between the judges in two of the three categories.

Also, although it is not possible to assess the statistical significance of the differences between the W values, it would seem that the Student Teachers are more homogeneous in their opinions than the other two groups, and that the Teachers are more homogeneous in their opinions than the Psychologists. To what extent this might reflect the broader issues that psychologists have to bear in mind is unclear, but such an issue would be worthy of more detailed study in and of itself.

3. Prior Subjective Utilities.

3.1 Introduction.

The prior utilities were subjective measures of the 'apparent usefulness' of the three strategies under consideration at a point when they had been described but before any empirical evidence of their usefulness was to hand. Details of how these were calculated are outlined in the Method Section, but a brief reminder may be of value to help place this data in context.

For any given strategy an individual judge assigned a subjective probability that it would likely meet each of the given Objectives in turn. When the probabilities for each Objective are multiplied by the appropriate weighting assigned to that Objective, and the resulting products summed across Objectives, the outcome is the Utility value for that Strategy, for that judge.

Prior subjective utilities were evaluated by three groups of judges - the same groups that provided the weightings:

1. Psychologists (N = 8)
2. Teachers (N = 7)
3. Student Teachers (N = 8)

Data was evaluated separately for the assessment and the intervention phases, using the appropriate objectives and weightings. (see p. 552 for details).

3.2 Prior Utilities - Assessment Phase.

Median Utility Values were calculated for each of the three groups of judges.

3.2.1. Utilities.

(a) Global Utilities.

JUDGES	STRATEGY		
	SCM*	UDM*	MM*
PSYCHOLOGISTS	287.4	161.5	318.8
TEACHERS	266.4	185.2	279.6
STUDENT TEACHERS	363.6	266.6	412.6

Table 8.

* Note: In the above Table, and in all the subsequent Tables where these abbreviations are used, the strategies can be identified as follows:

SCM: Structured Coherent Model

UDM: Unstructured Differentiated Model

MM: Multimodal Model

(b) Refined Utilities

JUDGES	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	356.0	203.2	401.6
TEACHERS	366.5	265.6	364.1
STUDENT TEACHERS	561.0	400.3	591.8

Table 9

Note: The distinction between the Global and the Refined Utilities is discussed in detail on page 268.

3.2.2 Discussion

The summarised Utility Values are presented in Table 8 and Table 9.

When the Global Utility values are used it can be seen that all 3 sets of judges found the Multimodal Approach (MM) to potentially offer the most useful method of assessment, with the SCM second and the conventional Child Guidance Approach (UDM) emerging as the least favoured. The same pattern is apparent for both the Psychologists and the Student Teachers with the Refined Utilities, but in this instance the Teachers are shown to marginally favour the Structured Approach (SCM), although the difference in utility values between the SCM Approach and the MM Approach is so minimal as to be unimportant.

On Balance, it is reasonable to conclude that on the basis of the bald descriptions given to the judges, the Multimodal Approach appeared to offer the most effective route to a comprehensive assessment in line with the set objectives.

3.3. Prior Utilities - Intervention Phase

Median Utility Values were calculated for each of the groups of judges, see Tables 10 & 11. Medians were used as a measure of central tendency, as they would minimise the influence of abberant judges' perceptions on the final Utilities.

3.3.1 Utilities

(a) Global Utilities

JUDGES	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	360.3	238.7	390.7
TEACHERS	420.3	357.6	351.6
STUDENT TEACHERS	379.6	337.7	294.8

Table 10

(b) Refined Utilities

JUDGES	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	698.1	540.4	731.6
TEACHERS	830.8	717.8	765.6
STUDENT TEACHERS	843.6	759.0	610.0

Table 11

3.3.2 Discussion

For both the Global and the Refined Utilities the Psychologists favour the Multimodal Approach. For both the Teachers and the Student Teachers the preference in both instances is for the Structured Approach (SCM). For the Teachers the MM Approach lies third when the Global Utilities are considered, but lies in clear second place for the Refined Utilities.

For the Student Teachers the MM Approach is the least favoured of the 3 strategies in both instances. The main area of interest lies in the dichotomy between the psychological and the teaching professions as regards the potential of the strategies to provide a framework for effective intervention.

In terms of the perceived potential of the three strategies to meet the intervention objectives, it is interesting to speculate about the possible reasons for the division of opinion between the psychologists on the one hand - favouring the Multimodal Approach - and the teachers (including student teachers) on the other hand - favouring the Structured Approach.

The teacher's preference for this Structured Approach suggests an attraction towards a strategy which involves a fairly lengthy commitment on the part of the Unit staff to withdraw the child for specialist, individual, and also small group teaching. Thus, the main characteristics of this strategy are:

1 Regular withdrawal of the child outwith the normal classroom context.

2 An approach which is broadly educational in its emphasis, mirroring a "more of the same" attitude, in as much as the process in the Child Guidance based Unit would seem to be an extension of normal teaching in the classroom.

This somewhat cautious and conservative approach on the part of teachers is consonant with the findings on teacher attitude reported by Croll & Moses (1985) and by Gipps, Gross & Goldstein (1986).

On the other hand, it is interesting to note that the Multimodal Approach is apparently more attractive to Psychologists. Consideration of the description of the Multimodal Approach - especially the comprehensive holistic nature of the BASIC ID - suggests it is much more psychological in emphasis and it would appear to lay equal, if not more, emphasis on factors other than the more overtly educational ones - such as the reading difficulty. It is also intriguing to note that the psychologists are generally least happy with the conventional practice within much of Child Guidance, as represented by the UDM Approach. It suggests the paradox that psychologists are, in part, maintaining a system which they recognise as not very satisfactory and where they can appreciate more useful alternatives.

This dichotomy between the more obviously educational approaches and the more holistic psychological approach, is further emphasised by the fact that both the teachers and the student teachers generally preferred the Unstructured Approach over the Multimodal Approach, although this is somewhat more ambiguous.

3.4 Prior Utilities - Some General Points

As has been shown, on balance the Multimodal Approach was the preferred strategy when looking at the assessment phase, although when intervention is considered, teachers are apparently happier with a model that demonstrates a commitment to dealing more directly - and possible exclusively - with the presenting learning problem.

This of course, raises the question as to why teachers find some considerable merit in the Multimodal Approach for assessment purposes, yet when intervention is planned they tend to focus on only one aspect of the Multimodal assessment - namely the overt manifestation of the learning problem - to the exclusion possibly of other identified areas of legitimate concern. The answer possibly lies in the fact that although teachers are encouraged to consider the whole child, their training focuses thinking ultimately onto the teaching component, with the consequent expectation that any other difficulties would be dealt with in another context - ie: while the teacher may consider the whole child, they regard it as their responsibility to act on a much narrower front. For example, emotional/behaviour difficulties would often be referred directly to the psychologist and not seen as a teaching or curricular issue.

It would also be worth noting that these results are consistant with the teacher's perceptions of the objectives which are most important - namely objectives which deal most directly with the presenting learning problem. (see Table 4, p.286 & Table 6, p.289)

3.5 Prior Utilities - Implications for the Multimodal Approach

Lazarus (1976) insists that a thorough and comprehensive assessment is a fundamental pre-requisite for a coherent and potentially successful intervention and that the Multimodal Approach offers a framework on which such an assessment can be built. It would appear from considering the prior utilities, that psychologists would accept this assertion when considering the potential of the Multimodal Approach with children who have learning difficulties. However, in order

to promote the Multimodal Approach with other professionals - especially teachers - psychologists would have to demonstrate that:

1. The assessment produced was comprehensive and valid, and that it would lead on logically to a more thought out intervention strategy.
2. The breadth of the Multimodal assessment is justified in terms of dealing with other factors not directly related to the learning problem, and that such a broad spectrum intervention is worthwhile and valid.
3. Such a Multimodal View does not devalue the need for direct teaching intervention, but seeks to logically expand the intervention options in appropriate ways.

In the writer's experience, this difference in "band width" of perception of psychologists as opposed to teachers is a perennial problem in the interaction between Child Guidance Services and Schools. Schools tend to be more interested in the direct manifestation of the problem as it effects the learning environment for both the child and the school, whereas the psychologist will often stand back and take a more all embracing view. This dichotomy is especially marked in the area of learning difficulties - covering as it does an area central to the work of the school. The prior utilities would suggest that the Multimodal Approach may go some way towards breaking down this dichotomy, possibly through appropriate in-service support for teachers - a general need of teachers clearly identified by Gipps, Gross & Goldstein (1986). Whether, when actually implemented, the Multimodal Approach

succeeds in doing this is the issue addressed in the next part of the study.

4. Posterior Utilities - Assessment Phase.

4.1 Introduction.

The prior utilities gave an initial subjective view about the apparent usefulness of the three strategies under consideration, from the perspective of the three distinct groups of judges - broadly representing two professional groups with a legitimate interest in the area of learning difficulties. The next stage in the process was to consider the extent to which these initial opinions stand up in the light of evidence coming from the actual use of these three strategies.

As will be clear from the Method Section, there was a slight difference in the manner in which the posterior utilities were evaluated compared with the prior utilities, although the underlying principles remained unaltered. There was an additional layer of "Experts" who provided the posterior probabilities which were combined with the weightings obtained from the initial groups of judges in order to generate the posterior utility values.

4.2 Posterior Utilities - Assessment Phase.

The assessment data was considered by six "Experts", and median utility values obtained using the weightings of the psychologists, teachers and student teachers, and, of course, the posterior probabilities supplied by these experts.

4.2.1 Utilities.

The assessment data was obtained from 18 subjects - 6 from each strategy. Tables 12 & 13 give the median utility values for the Global and Refined calculations respectively. The raw data from which these results were derived is shown in the Appendix.

(a) Median Global Utilities.

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	113.3	101.7	314.9
TEACHERS	116·7	104·4	317·3
STUDENT TEACHERS	158.0	130·8	385·7

Table 12.

(b) Median Refined Utilites.

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	135.8	126.0	397.1
TEACHERS	149·1	140·9	445·3
STUDENT TEACHERS	221.0	198.8	619.4

Table 13.

4.3 Discussion.

In all instances it will be apparent that the Multimodal Approach was seen as giving the best assessment in terms of the objectives set. The Structured Approach (SCM) was seen

as being next best, with the Unstructured Approach (UDM) being consistently seen as giving the least useful assessment data.

The results show a singular unanimity of opinion - regardless of the weightings used - favouring the Multimodal Approach. This may be considered as fairly convincing evidence that the Multimodal assessment is more effective than the more traditional approaches used in Child Guidance practice. The results also strongly reinforce the prior subjective utilities which also favoured the Multimodal Approach.

As will be recalled, the Decision Theoretic Methodology provides summarised data which can be used to facilitate informed decision making. On the basis of both the prior subjective utilities and the subsequent data based utilities, a strong case could be made to professionals dealing with learning disabled children - teachers, psychologists etc - to seriously consider the Multimodal Approach as a method which would enhance their assessment skills.

4.4 Qualitative Comments on Assessment Phase.

In addition to assigning probabilities to the assessment data presented on each of the 18 subjects used in this phase of the study, the "Expert Judges" were also invited to comment in more general terms about the assessments they had been presented with. The questions asked are presented in the Assessment Questionnaire, which is shown in the Appendix to the Methods Chapter. It would not be the intention to analyse these subjective comments in great detail in this context, but there are certain general points which emerge, and which would be worth noting.

1. It would appear that the "Expert Judges" found the Multimodal assessment format such that it presented the information in a form which was readily assimilable, although in the first instance the layout took time to get used to.

   The comments on the other two strategies were much more mixed. The structured approach was seen as presenting readily assimilable information, but there was a lack of depth in the assessment. With the unstructured approach, where different psychologists used their own preferred methods of assessment recording, the comments varied in a manner which reflected this unevenness.

2. Both the Structured (SCM) and the Unstructured (UDM) approaches came in for a variety of criticisms which highlighted the limited nature of the information given, which was largely relating to the learning difficulty. Particular points emerging suggested that more background information on the school and the home circumstances would have been valuable. The Multimodal Approach (MM) also came in for some criticisms mainly relating to the fact that the structure of the assessment, while giving a very broad view of the child, still lacked contextual elements which may be considered important when looking at the child's difficulties.

3. There were also a considerable number of comments which were very positive about the manner in which the Multimodal assessment led logically on from problem definition to objectives and subsequently to intervention plan. This

individualised programming was something that was not apparent in the assessment information for the other two strategies.

The main theme which comes over in many of the comments made - regardless of the strategy - is a plea for more attention to be given to presenting relevant background information about the child - especially home and school related factors.

In good Educational Psychology practice, these background features will always be considered, but the need to weave any relevant information into the overall report comes across very strongly in the comments made. The Structured Approach (SCM) is seen as relatively efficient, but in no way an outstanding method of gathering information.

The Unstructured Approach (UDM) is seen in terms of the strength and weakness of the individual features of the assessments.

The Multimodal Approach (MM) generally meets with considerable approval, but one or two of the cautionary comments made pointed to the need to see more evidence of the Multimodal Approach in action.

4.5 Posterior Utility Results and Qualitative Comments - Implications for the Multimodal Approach.

When all the data - both utilities and qualitative comments - are taken as a whole, there would appear to be strong evidence to support the Multimodal approach in undertaking assessments for children with learning difficulties. Any professional in

a position to be making decisions about their own practice in this area, or in a position of recommending practice in this area, could reasonably be expected to be impressed by the evidence presented, but in order to further promote the utility of the Multimodal approach the following needs appear to emerge:

1. The need to ensure that relevant background and contextual information is made available alongside the individualised multimodal profile.

2. The need to ensure that professionals using the approach are adequately trained, and the need to consider the training needs of others who may be the consumers of the assessment - e.g. teachers, parents, related professionals. The structure of the multimodal framework is different to what most people are used to, and this would have to be clearly borne in mind when deciding to adopt it.

5. Intervention Phase.

5.1 Introduction.

As with the Assessment Phase, where the prior subjective utilities were then compared with the outcomes of actual practice, so it was important to consider what the actual outcome was in terms of the intervention objectives, when each of the three strategies were applied to children with learning difficulties.

The mechanics for evaluating the posterior utilities for the Intervention Phase are outlined in the Method Section. In addition, it is to be recalled that data was collected on an on-going basis. As a child entered into a programme there was a battery of initial assessment data - termed the Starting Data. At the same point about eight to ten months into the

programme the child was re-assessed, and this data was termed the Intermediate Data. The child continued to carry on through the programme for another eight to ten months approximately, and was then re-assessed again. This data was termed the Final Data. As far as evaluating utilities was concerned, this was done on two separate occasions in order to give a revision of progress, thus:

Run 1: Starting Data to Intermediate Data.

Run 2: Intermediate Data to Final Data.

The utility values were calculated for each Run separately.

5.2 Posterior Utilities - Intervention Phase - Run 1.

The intervention data was considered by six "Experts", and median utility values obtained using the weightings of the psychologists, teachers and student teachers.

5.2.1 Utilities.

(a) Median Global Utilities.

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	230.0	224.0	255.4
TEACHERS	275.3	261.1	291.1
STUDENT TEACHERS	195.5	190.2	201.1

Table 14.

(b) Median Refined Utilities

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	446.8	434.2	446.4
TEACHERS	534.2	538.5	555.8
STUDENT TEACHERS	408.2	406.9	405.0

Table 15

5.3 Discussion - Run 1

Tables 14 and 15 give the median utility values for the Global and Refined values respectively.

5.3.1 Global Utilities

As will be observed, there is unanimity of opinion regardless of the source of the weightings employed that the Multimodal Approach produced the better outcome, followed by the Structured Approach and finally by the Unstructured Approach.

5.3.2 Refined Utilities

In this instance the pattern of results is less obvious than was the case with the Global Utilities. With the psychologist's weightings the Multimodal Approach and the Structured Approach have virtually identical utlities. For the teacher's weightings the Multimodal Approach shows a clear advantage followed by the Unstructured Approach itself being marginally preferred over the Structured Approach. When the student teacher's weightings are used the pattern becomes even less clear. Only '3' points covers all three strategies, with very marginal advantage being shown to the Structured Approach over the Unstructured and Multimodal Approaches respectively. However, it is reasonable to suggest in this instance that such a '3' point range does not really allow for a sufficient level of discrimination such as may be required in a general decision making context.

5.3.3 General Discusion - Run 1

When the Refined·values are used, which involved breaking down opinions about objectives into the constituent components of the objectives, the picture obtained is confused and the proximity of the Median Utilities makes it very hard to draw any firm conclusions. However, when the less detailed and broader Global values are used, the sense of discrimination is much greater and it becomes clear that the Multimodal Approach is the preferred strategy.

The 14 subjects who were being followed through in the three strategies did not all commence their programmes at the same time. The time span between commencing the programme and the collection of the Intermediate data ranged from a minimum of six months to a maximum of ten months, with the majority of subjects being re-assessed at approximately eight months after commencement of the programme. Thus, at this intermediate stage all of the 14 subjects had been receiving extra support - regardless of strategy - for at most ten months. This period inevitably included holidays and therefore in terms of the long standing nature of the learning difficulties, this could not be considered as a long period of specialist intervention.

Bearing this in mind, it is perhaps not surprising that the picture which emerges is somewhat clouded and unclear. Apart from the anomaly with the Student Teacher's weightings using the Refined values, it could be said that the Multimodal Approach has given some encouraging short term results, and that the Structured Approach also offers a positive picture. Clearly, from a Decision making point of view, it would be unrealistic to imagine that the data at this stage could be considered definitive enough to support policy options, and it would be important to follow up progress over a longer time span. However, if all other things were equal, the decision would have to be made in favour of the Multimodal Approach. When considered in concert with the strong vote of confidence obtained in the Assessment Phase, the developing picture undoubtedly suggested that the Multimodal Approach had begun well when actually translated into an intervention programme.

5.4 Posterior Utilities - Intervention Phase - Run 2.

12 subjects were followed up at a later point in their programmes, and the new data was again considered by the six "Expert Judges" as before. (2 subjects from Run 1 dropped out).

5.4.1 Utilities.

(a) Median Global Utilities.

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	222.9	191.2	279.4
TEACHERS	287.9	242.2	328.3
STUDENT TEACHERS	195.7	168.7	229.8

Table 16.

(b) Median Refined Utilities.

JUDGES USED FOR WEIGHTINGS	STRATEGY		
	SCM	UDM	MM
PSYCHOLOGISTS	435.9	385·1	527·1
TEACHERS	579·0	506·1	650·9
STUDENT TEACHERS	415.8	370·8	489.2

Table 17.

5.5 Discussion Utility Data - Run 2.

Tables 16 & 17 give the Median Utility Values for the Global and Refined Values respectively. Details of how these values were calculated are given in the Appendix.

5.5.1 Global Utilities.

In all three instances there is unanimity of opinion. The Multimodal Approach is the preferred strategy, followed by the Structured Approach and finally the Unstructured Approach.

5.5.2 Refined Utilities.

Unlike Run 1, where the utilities calculated using the Refined values were somewhat inconsistent, in this instance the picture is quite clear and exactly reflects that shown by the Global Utilities.

5.5.3 General Discussion - Run 2.

Run 2 commenced from where Run 1 had terminated, and the 12 subjects were followed through for approximately another eight months - six months was the shortest follow through, and nine months the longest. As was shown, at the end of Run 1 there

was a degree of ambiguity in the Utility data, although there was a suggestion that the Multimodal Approach was evolving quite well. By the time the final Run 2 data was collected, the subjects had been involved in their programmes for an average of approximately sixteen months. By this time, it seems clear that the data is producing a firm trend towards the Multimodal Approach being seen as providing the most effective intervention, followed by the Structured Approach, with the Unstructured Approach being seen as consistently the least effective.

What are the possible conclusions that can reasonably be drawn from these results?

1. The Multimodal Approach provides a very structured logical and holistic approach to the assessment of the child, and the assessment itself 'drives' the subsequent intervention. Thus, the intervention strategies adopted may be various and diverse, but they are still held together by the structure of the Multimodal framework.

2. The Structured Approach provides, as the title suggests, a very structured, coherent and consistent approach to both the assessment and the intervention phases. While the assessment will be a determiner of subsequent intervention, it is important to bear in mind that this occurs exclusively within the cognitive/learning mode, and involves the educational intervention with a specialist support teacher. Thus, the focus of the intervention is relatively uni-dimensional, and although structured does not allow for the variety of intervention apparent under the Multimodal Strategy.

3. The Unstructured Approach, while focussing within the cognitive/educational domain in general, does not have the Unifying feature of a structured and coherent approach to either assessment or subsequent intervention. It tends towards a reactive, piecemeal and ad hoc approach in which good practice becomes intertwined with bad practice, and the net result is clearly not seen as satisfactory overall.

Thus it may be concluded that structure is a necessary but not sufficient factor in the potential success of a given strategy in intervening with children with learning difficulties. Where the Multimodal Approach clearly scores over the Structured Approach is in the broad spectrum of functioning that is subsumed under the BASIC IB framework. Thus, it is possible to plan an intervention programme which is specific but also broad based. It can focus on the child's specific learning difficulty, but also on other aspects of the child's functioning. The outcome of the intervention phase of this study tends to support the validity of taking such a broad based, yet planned and structured, approach to the presenting problem. Inspection of the original Objectives set by the Experts at the beginning also emphasises the fact that it is the whole child who is being dealt with not simply the presenting reading difficulty.

Thus, for the decision maker who is interested in planning a service for children with specific learning difficulties, the outcome of the intervention runs would seem to point to the conclusion that the Multimodal Approach would be worthy of serious consideration as a working model for adoption. The

results support Lazarus' contention that the best and most elegant outcomes of intervention involve the consideration of, and the planned intervention across, all seven vectors of the BASIC IB, Lazarus (1981). Thus, if the consideration is for the whole child, then the Multimodal Approach would seem to offer to professionals a methodical and structured approach of building a whole child approach to the problem of specific learning difficulties.

6. General Conclusions on Strategies.

Before making some general comments about the three strategies under consideration, there are several points which should be re-emphasised.

1. As will be clear from the analysis of the data, and the description of the methodology employed, it was not the intention of this study to consider the minutiae of each strategy in detail. The important point at all times was to provide useful and relevant data on which informed decisions could be made. By setting objectives, and by assessing how well each strategy came up to the demands of each objective, it was the intention to make explicit processes in such an applied setting that more often than not remain implicit. Thus, in order to manage the complexities and variations existing in the overall applied psychoeducational process, it was necessary to stand back at a more general level in order to facilitate the decision making process.

2. In terms of utility values, comparisons are being made between strategies on the basis of relatively small sample sizes. It may well be that readers used to more conventional methodologies would be uneasy about this. However, as has been discussed before, the methodology of the Decision Theoretic Approach seeks to deal with this problem - there are two points worth making in this instance:

   (a) At all times, it was the intention of the research to base itself in the reality of day to day educational psychology practice, and consequently, one can only work with the presenting population as it stands at any given point in time.

   (b) The methodology should not be seen as static - like in conventional methodology, where the study has a clear end point. With the methodology adopted, the data base can be added to as and when more subjects undertake any of the given programmes. As more data is added, so the utility values can be further refined, and so the decision maker has access to continuously updated information in order to help make the appropriate decision. In essence, this study can be considered as a 'snap shot' in time of a process which could go on as long as the appropriate stakeholders felt it was necessary.

With these pointers in mind, it is possible to look at the general points that emerge from the study. The objective of the research was to present readily assimilable information which

would - as has been stated above - facilitate decision making regarding how resources within a Child Guidance Service, and the related Education Services, might be deployed to effectively deal with the difficulties experienced by children with significant learning problems. In a hierarchial system, such decisions may be taken by a Principal Psychologist or even by an Educational Administrator. On the other hand, as the decision would more often than not be an issue for professional judgement, the decision maker may well be the front line professional who has responsibility for a given programme.

However, regardless of the decision maker, this study would seem to suggest the following:

1. In terms of the strategies considered in this study, the Multimodal Approach would appear to offer a very useful and comprehensive assessment framework, and the intervention which flows from this also offers the best approach to actually dealing with the presenting difficulties.
2. When considering the two more traditional strategies in this study, the more tightly structured approach is seen as more useful than a variety of more loosely conceived and variable approaches.
3. Regardless of strategy, background contextual factors - especially home and school - are important, and should be considered along with the individualised profile of the child.

In addition to these general conclusions about the strategies, there are some other more specific points that any decision maker would need to consider:

1. If the Multimodal Approach were to be adopted, it would require a commitment to that approach from the professionals involved, and certainly, in the short term, this may not be easy.
2. Following from point 1 above, there would be in service and professional development needs which would have cost implications in terms of time and resources. These would include:
   (a) Initial training in the Multimodal Approach for relevant professionals.
   (b) Disjointed service delivery while any change-over took place - how to deal with this.
   (c) Further professional resource demands that might flow from the broadening of perspective which the Multimodal approach would imply.
3. The Multimodal Approach lends itself to a wide range of presenting difficulties - not just learning problems - and as such, an investment in time and resources to train professionals may well have beneficial 'spin off' effects in other areas of service delivery.

At the end of the day, whether a Multimodal Approach is adopted will depend on decisions being made both in terms of outcome, and also in terms of more general factors which are outwith the remit of this research, such as the professional development

issues highlighted above. However, it would be the contention in this instance, that the utility data generated by this study would justify the Multimodal Approach being seriously considered as a useful way of looking at the problems of learning disabled children.

7. Multimodalism and Learning Difficulties.

It was a major objective of this study to consider how effectively Lazarus' Multimodal paradigm could be applied to the problem of children presenting with learning difficulties. The methodology adopted did not pretend to offer comparative measures between the Multimodal Approach and the other strategies considered, in a conventional experimental model. It did, on the other hand, seek to present information about the strategies in a manner that would facilitate informed decision making. Thus, it is against this background that the issue of using the Multimodal Approach has to be considered.

It will be recalled from considering the review of literature on learning difficulties, there is research evidence to support an interaction between learning difficulties and virtually all aspect of human functioning. Whether the research emphasises possible causative features in learning difficulties, or whether it emphasises related features which impinge more indirectly on the problem, it was shown that the 7 vectors of the BASIC IB provided a framework against which the issue could be considered. This would support Lazarus' contention that the BASIC IB provides a comprehensive and coherent framework against which to consider

human psychological functioning, Lazarus (1981). Thus, it would seem appropriate to argue that the Multimodal Approach offers a comprehensive backdrop against which to consider the whole child in addition to the presenting learning difficulty.

8. RESEARCH METHODOLOGY

8.1 INTRODUCTION

As was pointed out in the Introduction to this whole section, the issue of the usefulness of the Decision Theoretic Methodology was also of interest in the study. This approach to research design, initially described by Edwards, Guttentag and Snapper (1975) was adapted in accordance with the needs of this study, and formed the basis of the decision making outcomes.

As was discussed in the Methodology Section, the nature of such an applied research project required trying out such a methodology. Consequently, it is important to consider the contribution that the methodology has made, and to consider the possible utility or otherwise of this approach.

Since the methodology was an integral part of the whole study, the comments made will reflect the general experience of the researcher, and others who were involved in the process as active participants.

8.2 ADVANTAGES OF THE DECISION THEORETIC APPROACH IN PRACTICE

The general advantages of this approach have already been discussed in the Methodology Section, and the comments here will focus on the advantages as they pertain to this study.

1. At all times the methodology was able to map quite accurately onto what happens in reality in an applied decision making setting - the pros and cons of a decision are weighed against the perceived objectives, leading ultimately to a decision. In reality, of course, this process often occurs at an implicit

level, and individuals or groups arrive at decisions with no real evidence for how that decision was made. With the Decision Theoretic Methodology this process is forced into the open and made quite explicit:

- the objectives have to be clearly stated and then prioritised.
- the strengths and weaknesses of various options have then to be explicitly mapped against these objectives.

2. The methodology allows for a coherent method whereby both the strengths and the weaknesses of any given strategy could be taken into consideration, and balanced against one another to arrive at a conclusion. As Cronbach (1983) points out, it may be all too easy to highlight the advantages of any given programme and to subsequently underplay the disadvantages and drawbacks. The Decision Theoretic Methodology provides a means of avoiding this bias, and facilitates a balanced view of the strategy under consideration.

3. In dealing with learning disabled children in a real life situation, the researcher has to be aware of the fact that the emergence of appropriate subjects is not dictated by the demands of research design. Thus, the methodology employed has to allow for considering each subject as, in effect, a single subject research exercise, while at the same time having the facility to draw together accumulations of data to provide a more general overall picture. This the Decision Theoretic Model allows the researcher to do. Each individual subject's progress - or lack

of it - can be evaluated against the objectives set, by calculation of appropriate utility values. As more subjects pass through a given programme, the accumulation of data gives a broader overall view of the strategy under study. Thus, this facility to continually revise utility values on the basis of more data allows for a dynamic form of evaluation research which traditional models of research design do not have, and such an approach is more in keeping with the needs of research in an applied setting.

4. An allied point is that the methodology does not in itself require the existence of control or comparison subjects. In this particular study it was decided to compare three different strategies, but this was not a requirement of the methodology. Had an evaluation been required of the utility of any one strategy, prior and posterior utilities could have been calculated as before, and the data would provide some measure of the usefulness of a given strategy, in terms of the extent to which it lived up to, surpassed, or fell short of, the prior subjective opinions which were held. This has obvious attractions to the applied researcher who cannot be confined by the constraints of a more traditional research design.

5. In evaluating a given programme or strategy, the Decision Theoretic approach removes the necessity for a 'no treatment' control group. This, in turn, also removes the moral dilema which researchers often face in an applied setting, of denying an intervention programme to a given individual who requires help, and who may well benefit from it, purely because of the demands of experimental design.

6. The prioritizations and weightings assigned to the objectives is clearly crucial in the Decision Theoretic Methodology, in determining final utility values. Thus, this method has a quite unique advantage in that the weightings can be determined by the individual or group of individuals who have the greatest stake in the outcome, and who will be most directly involved in the decision making process. So, not only will the decision makers have access to the utilities in order to help in their task, by being involved in the objective setting weighting, they can also be proactive and, in effect, define the parameters that will influence the decision making. Thus, the researcher can tailor the outcome of the research to the needs of the consumers, by appropriately involving them at both the beginning and at the final decision making stage.

7. The mathematical and arithmetical skills necessary to compute utility values are minimal, and the principles behind the methodology are relatively simple, and hence the results need not engender the anxiety in both researchers and consumers that is often the case with more conventional statistical methods.

8.3 DISADVANTAGES OF THE DECISION THEORETIC APPROACH IN PRACTICE

In addition to the advantages highlighted above, problems with the Decision Theoretic Approach also emerged throughout the duration of the study.

1. It may be argued that it would be of interest to a researcher to consider the effects of the strategies in more detail. For example, it might have been interesting to see if the Multimodal Approach addressed/

one or more of the stated objectives better than others, and to consider why this might have been the case. The Decision Theoretic Methodology will not allow for such discriminations, as the whole philosophy of the approach emphasises a holistic view, with the overall outcome being seen as important. Thus, the Decision Theoretic model does not allow for the tight discriminations that can be controlled for in a traditional experimental design. Had it been the aim of this study to be discriminating then the Decision Theoretic Methodology would not have been chosen.

2. At all times, the success - or failure - of the methodology relied on the commitment and good will of all the individuals involved. Whether it was the objective setting phase, the weighting phase, or the probability evaluation phases, it was necessary to recruit willing and competent personnel, otherwise the exercise would have foundered.

   In other situations this may not be such a major problem eg: if it was the job and remit of a given individual to undertake such tasks .

   However, in the applied setting in which the study was carried out, it was necessary to obtain the cooperation of fellow professionals who all have many legitimate claims on their time, and who understandably, therefore, have to set such tasks as the methodology demands into their own set of priorities. At times, this undoubtedly caused difficulties in terms of getting data and responses tailored to a given time schedule. This is, of course, not a problem inherent in the principles of the methodology, but a problem of pragmatic realities, which such a methodology will have to address in any situation.

3. Although no one step in the various processes is, of itself, complex, the tasks that individuals are asked to undertake - eg: weighting objectives - can appear quite awkward, and this leads to a need for:
   - Either the personal involvement of someone familiar with the process, to act as a consultant while the task is being completed,
   - or, very lucid and structured notes on completion.

   For some individuals the descriptive notes were clearly not adequate, and this resulted at times in delays and possibly unnecessary complications, while such individual misunderstandings were sorted out.

4. In virtually all instances, the professionals who were involved in making judgements at any point in the research process, found the task - at times - inordinately time consuming, and it was clear that in some instances, good will and cooperative spirit were stretched to the limit.

5. The calculation of each utility value is, of itself, arithmetically a very simple exercise. However, the sheer number of calculations occasioned by the various permutations available, became logistically quite unmanageable, and had it not been for the timely arrival of a computer programme which dealt with the mechanical side of the calculations, then there was every possibility that the whole evaluative process would have faltered under the sheer weight of necessary calculations. This was not a difficulty that was foreseen at the start of the

study - although it should have been - and a naive complacency over the volume of calculations involved nearly jeopardised the whole study.

8.4 METHODOLOGY - GENERAL COMMENTS

As may be apparent from the above discussion, it would appear that the Decision Theoretic Methodology does have a lot to offer the applied social scientist, and it provides a potentially valid approach to considering the efficacy of many practices undertaken in Educational Psychology.

The very initial process of requiring objectives to be clearly stated, could in itself help clarify thinking in many areas of Educational Psychology practice. However, before considering introducing the methodology in a more general way, the following issues would require to be addressed:

(a) A more detailed and descriptive handbook would require to be developed in order to facilitate the process for the persons asked to contribute.

(b) There would undoubtedly be the need for a general computer programme to be created, which would be able to deal with the mechanical calculations that any study generated. The programme used in this study was situation specific, and not generalisable in its present form.

Despite the problems - many of which resulted from underestimating the work involved in some of the tasks - there is no doubt in light of the experience of its use in this study, that the Decision Theoretic Methodology should have a place in the armoury of the Educational

Psychologist. In the experience of the writer, it would appear that if the appropriate methodologies were available - such as the Decision Theoretic approach - then Educational Psychologists would welcome the opportunity to undertake evaluative research in many areas of their work.

9. FURTHER RESEARCH AND INITIATIVES

9.1 INTRODUCTION

It would be appropriate to consider the various developments that may flow from the research reported in this thesis. The writer has, at this point in time, been involved in adapting the Multimodal approach to other areas of Educational Psychology practice, and active consideration is being given to further developments with the Decision Theoretic Methodolgy. Each area can be considered in turn.

9.2 THE MULTIMODAL APPROACH - FUTURE DEVELOPMENTS

There are various possible developments in this area .

9.2.1 LEARNING DIFFICULTIES

An obvious point of departure for further research would be gathering of more data on children with learning difficulties. As was pointed out previously, it is clearly not possible to be definitive about any programme or strategy on the basis of a sample size of 4 subjects, and it would be appropriate to continue to accumulate data which could be used to further refine the utility values. The Decision Theoretic Methoddogy does, of course, allow for this 'rolling' form of data gathering. The main pragmatic difficulty lies in having regular access to "Expert Judges", and further data which has been gathered subsequent to the research described in this thesis is awaiting the setting up of a "bank" of such "Expert Judges", who will agree to undertake the evaluation task as, and when, data arises.

9.2.2 CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

Work has been undertaken using the Multimodal approach in the assessment

and review of children receiving special educational provision. No systematic evaluation has been carried out as yet, but the framework has proven useful with children with a range of special educational needs, and has also proven popular as a benchmark for teachers and often professionals.

Note: Example of the use of the Multimodal Approach with a child with Special Educational Needs is given in the Appendix to this Chapter.

9.2.3 BEHAVIOUR/EMOTIONAL DIFFICULTIES

The use of the Multimodal framework has also been found to be useful in undertaking community assessments with children who present with behavioural and/or emotional problems. In the interdisciplinary forum that is involved here, other professionals have found the framework useful in directing activities in a coherent manner which delineates the responsibilities of the various contributors to such an assessment process. Again, the use of the multimodal approach in this context has not fully been evaluated, but it promises to be a fruitful area for development.

Note: Example of the use of the Multimodal Approach with a child undergoing community assessment is given in the Appendix to this Chapter.

9.2.4 INSTITUTIONAL SETTINGS

The work reported in the review of literature on the Multimodal approach by O'Keefe and Castaldo (1980) demonstrates the use of the multimodal framework as a context in which to consider all aspects of care and intervention in a Children's Home.

The problems associated with moving any given institutions towards a new way of working are considerable, but notwithstanding this negotiations are currently under way with a residential school for maladjusted children to consider adopting the Multimodal framework. If the approach is adopted, it will require close monitoring, evaluation and recording. This would potentially be an exciting development, and the author is hoping to be involved in a major initiative involving the multimodal approach in the forseeable future.

9.2.5 IN SERVICE TRAINING

Where the responses to the use of the Multimodal Approach have been favourable, there have been subsequent demands for in-service training. To date, introductory seminars and workshops have been run for psychologists and special needs teachers. Future initiatives are planned for social workers and in Colleges of Education.

9.3 DECISION THEORETIC METHODOLOGY

As was discussed in the section on the Decision Theoretic Approach, it does appear to offer a methodology which will be of considerable value in an applied setting such as Educational Psychologists work in. To date, there has been no formal work carried out to develop the approach, but the following initiatives are planned:

1. All the professionals who contributed to the evaluation reported in this thesis will be sent a questionnaire asking them about the nature of the task, and it is hoped that this will not only give some evaluation of the methodology in this

instance, but that it will also point to improvements that may be incorporated into the whole process.

2. Dependent in part on the outcome of the questionnaire returns described in 1 above, and also on the experiences gained in the research programme, it is the intention to write simplified and more detailed instruction notes that could be used in any setting that the methodology was adopted in.

3. The need for a generalised computer programme was highlighted, and, in time, this will be considered in conjunction with an individual with programming expertise.

4. Consideration is presently being given to using the Decision Theoretic Methodology as a framework on which to consider various possible methods of prioritising work within a Child Guidance Service. This is still very much at an exploratory stage, but it may offer a way of making a more informed decision about how to allocate time and resources within such a service.

5. In conjunction with initiatives outlined above, it is intended to develop an in-service package which will delineate the possible uses of the Decision Theoretic Approach within Educational Psychology practice in general, and which may be used to introduce psychologists and other interested professionals to the principles and details of the approach.

9.4 CONCLUSION

As may be seen, the research reported in this thesis has triggered off consideration of various developments both relating to the multimodal approach, and also relating to the Decision Theoretic Methodology.

As Educational Psychologists are coming under more and more pressure from a diversity of areas, to deploy their skills and resources over an increasing range of problems, the need for structured and disciplined practice, which can be meaningfully evaluated, and the need to make sensible and informed decisions, all become of paramount importance. The development of the Multimodal Approach and the use of a Decision Theoretic Methodology in evaluation may offer a useful way forward in tackling this dilemma.

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APPENDIX 1.

ASSESSMENT EXAMPLES FROM THE THREE DIFFERENT STRATEGIES USED.

S.C.M. ASSESSMENT EXAMPLE.

BACKGROUND ASSESSMENT SUMMARY

SUBSEQUENT UPON ENTRY TO READING UNIT.

Child: R.6.

(a) General Intelligence.

June, 1982: Stanford Binet I.Q. = 113
(Chronological Age = 5yrs 10mths).

(b) Attainments.

June, 1982: Language skills good
word attack skills poor
gaps in letter sounds
poor consonant blending.

Slingerland: (a) visual discrimination poor
(b) short term auditory sequential memory poor
(c) motor co-ordination poor

Dec, 1983: Neale : Accuracy = 6yrs 7mths
Comprehension =6yrs 9mths
C.A. = 7yrs 4mths

Audiometric assessment normal
Developmental history normal

(c) Summary:

Admitted to reading unit in January, 1984.

Child's Name: Date of Birth:

D1 383

In addition to a copy of the formal assessment report about which preceded his/her entry into the special unit for children with learning difficulties, could you please answer the following specific questions regarding the assessment that was carried out.

1. Apart from the child, would you indicate who else was interviewed by the case psychologist with a view to eliciting information about the child's difficulties?

Person	Designation
Parents	
Teachers	

In addition, was information sought from third parties indirectly (e.g. reports, etc.) If so, could you indicate who they were, their designation and the nature of the information they were able to give.

Person	Designation

No

2. Would you indicate what form any future assessment would take, once the child has embarked on a programme of remedial help in the unit.

a. What assessments would be carried out?

Neale
Vernon
Reading book
Free Writing

b. At what frequency would this be done?

December and May

c. How often will the child's progress be formally reviewed?

As above

d. Would you give a brief description of the procedures in a formal review of progress?

As above

3. We are interested in the approximate time involved in carrying out the assessment that has led to the child being placed in the specialist unit.

a. Since the initial referral, how many times has the psychologist seen the child - either for formal testing or interview, or both?

4 times

b. Could you say approximately the length of time that each such interview would take up (on average)?

40 mins

c. How many interviews with relevant others had the psychologist had? (e.g. parents, teachers)

Parents - twice

Teacher - 1

d. Again, could you give an approximate time that each such interview would take up (on average)?

30 mins (parents)
10 mins (Teacher)

e. Approximately, how much time was taken by the psychologist in administrative tasks relating to the referral? (e.g. report writing, test scoring, letter writing, etc.)

2 hours

f. If a formal pre-admission assessment meeting was convened, can indicate -

i. Who was present

No

ii. Time - [illegible] time

g. Once the child has entered the specialist unit, how often is the psychologist likely to see the child for assessment purposes?

Twice Yearly

h. Approximately, how long would such session last?

30 mins.

PROGRAMME.

1. Intensive help in remedial unit for 3 months - 3 sessions per week - 1½ hours per session.

2. Reduce to 2 sessions per week after 3 months, and monitor progress carefully thereafter.

U.D.M. ASSESSMENT EXAMPLE.

Remedial Unit Referral Form.

Name: I.N.

School: —

Address:

Class: —

Class Teacher: —

Parent/Guardian: —

D.O.B: 21.10.74

Position in Family: 1/1

Please answer the following questions and put relevent details overleaf.

Has the child regular attendance at school? Yes/(No)

Has the child attended more than one school? Yes/(No)

Does the child wear glasses? Yes/(No)

Does the child have a hearing problem? Yes/(No)

Has the child any other health problems? (Yes)/No

Does the child have any speech problems? (Yes)/No

Does the child have any language problems? Yes/(No)

Does the child have any emotional problems? (Yes)/No

Does the child present ~~emotional~~ Behavioural problems at home? (Yes)/No

Does the child present ~~emotional~~ Behavioural problems in the school? (Yes)/No

Are there any relevent factors at home which could have affected the child's reading ability? Yes/(No)

I.Q. Test WISC STANFORD BINET

Chronological Age: 8 yrs 1 mnth

Date: 13.12.82 / 30.4.90

B.R.A.

Result: WISC : VIQ = 101
PIQ = 115
FSIQ = 107.

BINET IQ = 85 (LACK OF COOPERATION)

Attendance

ATTENDANCE WAS POOR IN THE PAST DUE TO RECURRENT TONSILLITUS. (TONSILS NOW REMOVED)

Schools Attended

[redacted] PRIMARY.

Eyesight

INTACT AS FAR AS KNOWN

Hearing

AS ABOVE.

Other Health Problems

[redacted] HAS ATTENDED HOSPITAL FOR YEARS DUE TO FAILURE TO THRIVE — ALL TESTS NEGATIVE. REMAINS SMALL AND SLIGHT. NOW EATS BETTER.

Speech

VERY RAPID AND IMMATURE. APPARENTLY DEVELOPED A STAMMER ON STARTING SCHOOL.

Language

FINE.

Emotional Problems

VERY MUCH A LONER. CAN BE AGGRESSIVE WITH OTHER CHILDREN. VERY UNCOOPERATIVE AND NEGATIVE IN CLASS — IN AN OPTING OUT MANNER MOSTLY BUT AT TIMES HAS TANTRUMS.

Behaviour in School

AS ABOVE.

Behaviour at Home

A LONER. NEEDS TO BE FORCED INTO ACTIVITY. DREAMY.

Home Factors

ONLY CHILD. WAS LEFT WITH GRAN WHILST BROTHER WAS IN HOSPITAL BEFORE STARTING SCHOOL. ALWAYS ANXIOUS AND WITHDRAWN BUT STUBBORN.

Any other comments

TEST RESULTS

Date	13.12.82
C.A.	8yr 1m.
Reading(Mech) Burt	5yr 2m
Reading (Mech) Neale	6yr.
Reading (Comp) Neale	—
Spelling (D + D)	—
V-M Perception (Bender)	— 1 SD OF MEAN.
Aud Discrimination (Wepman)	—

391.

Aud Seq. Memory (Wisc)	POOR
Visual Seq. Memory (own test)	—
Laterality	R/L/R
Arithmetic	Basic + + — only
WISC	

Information 5
Similarities 14
Arithmetic 6
Vocabulary 12
Comprehension 13
Verbal Score 101

Picture Completion 13
Picture arrangement 15
Block Design 6
Object Assembly 17
Coding 9
Performance Score 115
Full Scale I.Q. 107

Child's Name: S I.N. R. Date of Birth:

In addition to a copy of the formal assessment report about which preceded his/her entry into the special unit for children with learning difficulties, could you please answer the following specific questions regarding the assessment that was carried out.

1. Apart from the child, would you indicate who else was interviewed by the case psychologist with a view to eliciting information about the child's difficulties?

Person	Designation
Class teacher - miss Hamilton	
Head Teacher	
Parent.	

In addition, was information sought from third parties indirectly (e.g. reports, etc.) If so, could you indicate who they were, their designation and the nature of the information they were able to give.

Person	Designation
Mrs Caldwell	Speech Therapist

bad Stammer.

2. Would you indicate what form any future assessment would take, once the child has embarked on a programme of remedial help in the unit.

a. What assessments would be carried out?

reviews

b. At what frequency would this be done?

once a term.

c. How often will the child's progress be formally reviewed?

once a term

d. Would you give a brief description of the procedures in a formal review of progress?

But ~~Schonell~~ a W T

Jackson's P.S tests 1 & 3

3. We are interested in the approximate time involved in carrying out the assessment that has led to the child being placed in the specialist unit.

a. Since the initial referral, how many times has the psychologist seen the child - either for formal testing or interview, or both?

once - interview.

b. Could you say approximately the length of time that each such interview would take up (on average)?

20 minutes

c. How many interviews with relevant others had the psychologist had? (e.g. parents, teachers)

none

d. Again, could you give an approximate time that each such interview would take up (on average)?

e. Approximately, how much time was taken by the psychologist in administrative tasks relating to the referral?
(e.g. report writing, test scoring, letter writing, etc.)

4 hours

f. If a formal pre-admission assessment meeting was convened, then indicate -

i. Who was present?

mrs muir & psychologists.

ii. Time taken in the meeting?

10 minutes

g. Once the child has entered the specialist unit, how often is the psychologist likely to see the child for assessment purposes?

on request

h. Approximately, how long would such session last?

PROGRAMME.

1. Remedial Unit - 3 sessions / week - 1 hour per session.

2. Speech Therapy in school - ½ hour session per week.

M.M. ASSESSMENT EXAMPLE.

Department of Education
Ayr Division

Child Guidance Centre
2 Donaldson Avenue
Saltcoats
Tel Saltcoats 63495

Strathclyde Regional Council

MULTIMODAL PROFILE.

Child's Name: .....

Address: .....

D/B: ..... Chronological Age: .....

School: ..... Class: .....

Teacher: ..... Psychologist: .....

Date: .....

Suggested Review: .....

The multimodal profile of a child considers a framework on which a child's whole functioning can be considered. The seven areas or modalities are not meant to be mutually exclusive, and independent areas of functioning, and inevitably some overlap will be apparent. Six of the modalities (Behaviour, Affect, Sensation, Imagery, Cognitive Processes, Interpersonal Relationships) are psychological constructs built on the seventh modality, (Health) which represents the child's physiological/ biological base.

This method of describing a child's functioning gives a valid framework on which to consider intervention/remediation strategies.

T. E. Williams, Senior Psychologist.

MULTIMODAL PROFILE.

The Multimodal Report considers the child's psychological functioning across the seven major modalities. The layout of the report follows in a logical and sequential fashion as follows:

PROBLEM DEFINED → **PATTERN OF PROBLEM** → **CONSEQUENCES**

PROBLEM DEFINED
(detailed description of main problem areas across seven modalities).

PATTERN OF PROBLEM
(How and in what situations the problems occur).

CONSEQUENCES
(what is the consequence for child and others of the problem as outlined).

→ **INTERVENTION STRATEGIES** → **INTERVENTION RECOMMENDATIONS**

INTERVENTION STRATEGIES
(across the seven modalities are there interventions that are psychologically appropriate).

INTERVENTION RECOMMENDATIONS
(A generalised recommendation which takes into account all aspects of the child's functioning).

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Problems	Clumsy and impulsive. Inappropriate attention seeking. Stammers.	Tight, emotional control. Internalises his feelings.	Poor gross motor skills and fine motor skills.	Very poor self image - low ego strength.	Intelligent, but does not work to capacity. R.A. = 8.9/12	Very poor peer relationships - no friends - frustrates family.	Organic base to motor problems.
Pattern of Problems.	Occur mainly in social situations, both in and out of school.	At all times.	Playing games and performing specific fine motor tasks.	Sense of failure in social situations.	Energies go into attention seeking behaviour and not class work.	In all social situations - home - school - scouts.	———
Consequences	Rejection by peers, upsets family (mainly mother).	Very tense.	Avoids or tries to "play the clown" to hide his problems.	Worries parents - reinforces his self-depreciating opinion of himself.	Teacher gets annoyed. Parents worried about his coping in Secondary School.	Rejected by others - ostracized.	———
Intervention Objectives	1. Control stammer 2. Learn appropriate social behaviours. 3. Stop and think before he speaks.	1. Gradually learn to express his feelings.	1. Improve gross motor skills. 2. Improve fine motor skills.	1. Improve his negative self image. 2. Increase self confidence.	1. Move attention to his school work. 2. Remediate his reading deficit.	1. Improve peer group relationships. 2. Improve family relationships.	1. Follow up and investigate organic nature of his motor problems.
Intervention Plan.	1. Attend speech therapist. 2. "Thought stopping exercises. 3. Social skills training.	1. Counselling. 2. Family work.	1. Gross motor work with ball and simple gymnastics. 2. Fine motor training programme - Frostig material	1. Hypnosis tape - self confidence and ego boosting.	1. Regular report by class teacher with feedback to boy and parents 2. Remedial teaching as necessary.	1. Behavioural rehearsal and role play. 2. Positive reinforcement.	1. Enquiry to G.P.

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Personnel Involved.	1. Speech Therapist. 2. Psychologist. 3. Parents/teacher	1. Psychologist	1. Teacher 2. Remedial Teacher.	1. Psychologist (monitors).	1. Teacher and parents. 2. Remedial Specialist.	1. Psychologist and family. 2. All relevant personnel.	1. Psychologist letter to G.P.
Evaluation	1. Speech Therapy review. 2. Parent and teacher filling in on-going rating chart. 3. Monthly reviews of his social skills progress.	1. Subjective view of his ability to express emotions and feelings. 2. Responses on self rating projective inventory. 3. Subjective assessment of family dynamics.	1. Regular evaluation on gross motor tasks 2. Regular evaluation on fine motor tasks.	1. Number of "genuine" positive self statements.	1. On-going assessment by teacher of class work. 2. On-going assessment by remedial specialist. 3. Scores on standardised teaching tests.	1. Sociometric analysis in school and boy scouts. 2. Subjective assessment by teacher and parents.	1. Report from G.P. or relevant specialist.
Review	1. Monthly gathering of information by Psychologist 2. Case Review with all personnel by 20.12.84	as before ←	as before ←	as before ←	as before ←	as before ←	Decision based on medical reports

Name: M7

D.O.B.: 24/4/73

Address: -

School: -

Class: -

Siblings: 3/3

Teacher: -

Brief Summary of Family & Home Circumstances.

Very caring + supportive family. Material + emotional care of the highest standard.

The report that follows will break the child's functioning down into seven areas which are non discrete and mutually interactive. These form the basis of a useful framework on which to analyse the child's difficulties and make consequent intervention suggestions. Each category has no intrinsic existence in its own right.

The seven categories are:

1. Overt Behaviours.
2. Emotions (Affective Processes).
3. Sensations (Physical/physiological).
4. Imagery (Mental Pictures).
5. Cognitive functioning and Thought Processes.
6. Interpersonal Processes.
7. Health.

Child's Name: M7 Date of Birth: 24·4·73 402.

In addition to a copy of the formal assessment report about which preceded his/her entry into the special unit for children with learning difficulties, could you please answer the following specific questions regarding the assessment that was carried out.

1. Apart from the child, would you indicate who else was interviewed by the case psychologist with a view to eliciting information about the child's difficulties?

Person	Designation
PARENT	
SPEECH THERAPIST.	
CLASS TEACHER.	

In addition, was information sought from third parties indirectly (e.g. reports, etc.) If so, could you indicate who they were, their designation and the nature of the information they were able to give.

Person	Designation
NIL.	

2. Would you indicate what form any future assessment would take, once the child has embarked on a programme of remedial help in the unit.

a. What assessments would be carried out?

(1) EDUCATIONAL TESTING

(2) ON-GOING INFORMAL REVIEW.

b. At what frequency would this be done?

(1) TERMLY

(2) EVERY 2 WEEKS

c. How often will the child's progress be formally reviewed?

TERMLY.

d. Would you give a brief description of the procedures in a formal review of progress?

EDUCATIONAL TESTING

CASE CONFERENCE.

3. We are interested in the approximate time involved in carrying out the assessment that has led to the child being placed in the specialist unit.

a. Since the initial referral, how many times has the psychologist seen the child - either for formal testing or interview, or both?

2 TIMES

b. Could you say approximately the length of time that each such interview would take up (on average)?

30 MINUTES

c. How many interviews with relevant others had the psychologist had? (e.g. parents, teachers)

PARENTS - 2 TIMES
TEACHER - 1 "

d. Again, could you give an approximate time that each such interview would take up (on average)?

30 MINUTES

e. Approximately, how much time was taken by the psychologist in administrative tasks relating to the referral? (e.g. report writing, test scoring, letter writing, etc.)

45 MINUTES / 60 MINUTES

f. If a formal pre-admission assessment meeting was convened, then indicate -

i. Who was present?

PSYCHOLOGIST
PARENT
REMEDIAL TEACHER
CLASS TEACHER

ii. Time taken in the meeting?

20 / 30 MINUTES

g. Once the child has entered the specialist unit, how often is the psychologist likely to see the child for assessment purposes?

TERMLY.

h. Approximately, how long would such session last?

40 MINUTES | 60 MINUTES.

PROGRAMME.

1. Remedial Unit - 2 days / week - 1 hour per session.

2. Family Therapy Contract with Psychologist.
   - Initially 10 sessions agreed, review thereafter as appropriate: 1 hour per session.

3. Speech Therapist - ½ hour per week session in school.

4. Progress 'log book' to be kept by family.

APPENDIX 2.

STANDARD FORMS AND SHEETS USED IN THE STUDY.

APPENDIX 2.1

INSTRUCTIONS FOR RATING AND WEIGHTING OBJECTIVES.

Consultative Group on Children with Learning Problems.

You will find a sheet enclosed with the ten aims and objectives stated on them. They are each labelled 1. - 10. in random fashion.
From now on, please refer to any given objective etc. by its number, as these will remain constant.
In this part of the task you are to be asked to do two things with these ten objectives:

a. Arrange them in a hierarchical order in which you perceive them in terms of importance.
b. Weight them in relation to each other.

The best and simplest way, to explain this task would be by means of an example. Thus, suppose in the first instance, you decided that the ten objectives could be arranged in the order 4, 1, 6, 10, 8, 3, 5, 7, 9, 2 in terms of importance. This in itself does not tell you very much. The important thing is how much difference you perceive in terms of importance between them. This may range from very little (or none) to a lot. Hence, we are going to use a weighting technique to obtain a more quantative measure of how you perceive the difference between the objectives. This is achieved as follows:

a. Decide on your hierarchy and write it down in the order most - least important. In this example that would lead to the following -

4 ---------- most important
1 ----------
6 ----------
10 ----------
8 ----------
3 ----------
5 ----------
7 ----------
9 ----------
2 ---------- least important

b. We now allocate an arbitrary weight of ten to the least important objective. Thus,

i.e.:	Objective	Weighting	
most	4		
	1		
	6		
	10		
	8		
	3		
	5		
	7		
	9		
least	2	10	(arbitrary value)

c. /

c. Now consider the objective next in the hierarchy to your least important, and ask yourself this question:
"At a subjective level, how much more important than the lower objective do I consider this one?"
Remember this is a purely opinionative exercise on your part. There are no right or wrong answers.
In this example, suppose you decide that objective 9 is as half as important again as objective 2, then it would be allocated a weight of 15,
i.e. $1\frac{1}{2}$ x 10 (arbitrary weight) = 15.
Thus, we would now have:

	Objective	Weighting	
most	4		
	1		
	6		
	10		
	8		
	3		
	5		
	7		
	9	15	$1\frac{1}{2}$ times
least	2	10	more important.

d. You would then proceed to repeat this exercise up to the top of the hierarchy, i.e. next you would consider how much more important, in your opinion, objective 7 is in relation to objective 9.
Thus, in the end we may end up with something like this, in your hypothetical example:

	Objective	Weighting	
most	4	144	twice as important
	1	72	of equal importance
	6	72	1.5 times as important
	10	48	of equal importance
	8	48	1.3 times as important
	3	36	1.2 times as important
	5	30	twice as important
	7	15	of equal importance
	9	15	1.5 times as
least	2	10	important

This example is meant as just that - an example - to illustrate the technique, and has no validity in itself.

It is important regarding the validity of the research that each of you complete this task independently from others that were in the original group. If you have any questions or misunderstandings about what is being asked of you, could you please direct them to me, and not to each other. I realise that what you are being asked to do may seem bizarre, awkward, and difficult, but I would beg your indulgence as this is an important part of the whole exercise.
Please don't hesitate to get in touch as soon as you feel you are having any difficulties.
I have also enclosed a grid sheet on which you can enclose your final responses.

Consultative Group on Children with Learning Problems

The following are the final ten objectives that any remedial strategy might seek to achieve.

1. The strategy should seek information about the child's functioning from a variety of different, yet relevant sources.

2. The assessment should be of a continuous and on-going nature, which would allow the programme to be flexible - allowing for feedback that leads to monitored change where necessary.

3. Information should be gathered about environmental and social factors that may influence the child's functioning.

4. Any intervention should be cost effective and an efficient use of limited resources and the assessment should clearly take account of this fact.

5. The strategy should elicit a profile of the child's strengths and weaknesses in the cognitive area, the affective area and the physical area.

6. The strategy should seek to improve the child's attainments and mastery in reading.

7. The strategy should seek to improve the child's perception of the value of reading, their motivation to read and their self confidence in reading.

8. The strategy should involve a clearly stated intervention that would allow for the practice and consolidation of the skills being taught in the remedial setting into the whole area of school life.

9. The strategy should involve a clearly stated intervention that would allow for the practice and consolidation of the skills being taught in the remedial setting into the home setting.

10. The strategy should be such that it allows for various intensities and degrees of intervention.

Summary Sheet of Objective Weightings

Objective	Weighting

most ---- importance --- least

Name: _____

Date: _____

APPENDIX 2.2

INSTRUCTIONS FOR SETTING PRIOR SUBJECTIVE PROBABILITIES.

NOTE: Identifying numbers in brackets ( ) beside each objective refers to the coding assigned in the text of the thesis.

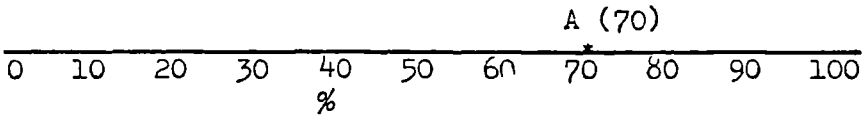
Children with Learning Problems - Evaluation various strategies.

You will have seen the sheets which give you detailed descriptions of three alternative remediation strategies that are going to be used to try and help children with learning problems. What you are going to be asked to do here is to make a subjective judgement as to the extent that each of the strategies in turn will meet the various objectives that have been set. The best, and easiest way to describe this process will be to go through an example.

Example: Objective 6.
The strategy should seek to improve the child's attainments and mastery in reading. Having read the descriptions of the three strategies A, B, and C in detail ask yourself this question:
"In my opinion, what is the chance (in percentage terms), that strategy A will meet the demands of objective 6?"

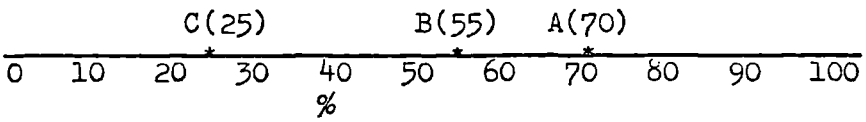
Remember, this is an opinionative question, with no right or wrong answers. Obviously, the lower the chance in your opinion, that a given strategy will satisfy a given objective, then the lower will be your percentage estimate and vice versa.

In this example, suppose you decide that there is a 70% change that strategy A is going to satisfy objective 6, you would fill this in on the line as follows:



Now repeat the question with strategy B and then strategy C in mind.
Thus, you may end up with the following:

Objective 6.



What this is saying is that, in your opinion, strategy A has the best chance of meeting objective 6, 70%, strategy B comes next, 55%, and strategy C has the poorest chance, 25%.

This procedure would then be carried out with each objective, and each strategy in turn.

For some of the objectives you will be asked to do this for the objective as a whole, and then for separate aspects of that objective. This, however, will become clear as you proceed.

STRATEGY 1 CO-ORDINATED METHOD (S.C.M.)

1. Assessment

The assessment will be based on the following:

a. Teacher's reports about the child in the classroom situation.

b. Psychological assessment using various standardised and unstandardised measures:
   i. I.Q. (W.I.S.C. -R)
   ii. Perceptual Tests (Frostig,Bender,ITPA subtests)
   iii. Reading Tests (Burt,Schonell, Neale)
   iv. Spelling Tests (Schonell,Daniels and Diack)
   v. Phonic Analysis (Jackson's Phonic Skills)
   vi. Aston Index of Learning Difficulties.
   vii. Emotional Behaviour (Bristol Social Adjustment Guides, Rutter Scales)

c. Interview with parents to seek a commitment to support the effort being made.

2. Intervention

The child will attend a specialist remedial unit in the Child Guidance Centre up to a maximum of five sessions per week of approximately 80 minutes per session, depending on the perceived needs of the child. There are four children in each group. Flexibility exists for phasing children in and out of the specialised unit. The initial period is one of on-going assessment which gives an individual profile of the child's abilities and problems, and this phases into the initial teaching programme.

The general strategy is to commence teaching from the child's strengths, and change emphasis to weaknesses once confidence has developed.

The teaching approach adopted tries as far as possible to match the child's difficulties.

Parent workshops are also undertaken on a regular basis in order to try and involve the parents in a meaningful way with the work of the specialist unit.

3. Reviews

This strategy involves an on-going review of the child's progress as an integral part of the programme.

STRATEGY 2 UNCO-ORDINATED METHOD (U.D.M.)

1. ASSESSMENT

The child will be assessed by the case psychologist, who will remain the only child guidance contact. This assessment will consist of:

1. I.Q. (W.I.S.C. -R)
2. Attainment levels in Basic Skills -
   Reading (Burt:Neale Analysis)
   Spelling (Daniels and Diack)
   Number (Ayrshire Basic Arithmetic Test; Burt 4 Rules)
3. Discussion, with Head Teacher and Class Teacher, of the child's problems.

2. Intervention

The child will atend a special remedial class at the Child Guidance Centre for two or three sessions per week - each session lasting 45 minutes. During this remedial session the child will receive tuition from a specialist remedial teacher which is focussed at a level appropriate to each child. Each child will be in a group of two or at most three children.

3. Review

The child will be formally reviewed on a six monthly basis. This review will involve the following:

a) The psychologist will re-test the child,using previously used tests.
b) The school will be invited for their comments and they may submit a report if they wish.
c) A discussion will take place between teacher, case psychologist and senior psychologist regarding the child's progress.
d) The parents will be invited for an interview, and the child's progress discussed with them.

In addition to this, the remedial teacher will make occasional visits to schools to discuss various children and to try and encourage a degree of clinic/school co-operation.

STRATEGY 3 MULTIMODAL METHOD (M.M.)

1. Assessment

The assessment will be carried out by the specialist psychologist, and will be based on structured interviews with the child, the parents and the teacher, as well as the use of formal standardised and unstandardised psychometric assessment devices where appropriate. The following seven areas will form the framework of assessment.

1. Behaviour. What behaviours are getting in the way of the child's happiness?. What should the child start doing ?. What should the child stop doing ?.
2. Emotions Is the child troubled by any "negative emotions"?. How does the child's emotions manifest themselves ?.
3. Sensations Does the child suffer from frequent or persistent unpleasant sensations (e.g. aches, pains, dizziness, etc ?).
4. Imagery What is the child's"self image" ?. Does the child use mental images and pictures at all?.
5. Cognition What is the child's intellectual and cognitive functioning (e.g. I.Q., attainment levels etc ?). Does the child show any evidence of irrational thought processes ?.
6. Interpersonal Processes Who are the most important people in the child's life ?. Does the child have problems with interpersonal relationships ?.
7. Health What is the child's physical health ?. What are the child's habits regarding diet,exercise, etc.?.

The aim of the assessment is to give a profile of the child's strengths and weaknesses across these seven areas.

2. Intervention

A programme would be implemented that would take account of the relative contribution of:

a) Home: co-operation with parents.
b) School:co-operation with teacher
c) Specialist Unit: The child would attend a specialist unit at the guidance centre on two occasions per week. They will receive appropriate tuition from a remedial teacher, and a psychologist will also be available for any other intervention that is deemed necessary.
Each child will be in a group of two or at most three children.

3. Review

This strategy involves an on-going reveiew of the child's progress with reference to the seven areas mentioned above, as an integral part of the strategy.

Objective 1. (1)
The strategy should seek information about the child from a variety of different, yet relevant, sources.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

Objective 2. (2)
The assessment should be of a continuous and on-going nature, which would allow the programme to be flexible - allowing for feedback that leads to monitored change where necessary.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

Objective 3. (3)
Information should be gathered about the environmental and social factors that may influence the child's functioning.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

Objective 4.
Any intervention should be cost effective and efficient use of limited resources, and the assessment should clearly take account of this fact.

1. Firstly make your judgement about this objective as a whole. (4T)

Low: 0 10 20 30 40 50 60 70 80 90 100 : High
Percentage

2. Now make the same judgement about the following aspects of this objective.
   a. The intervention should be a cost effective and efficient use of TIME.

Low: 0 10 20 30 40 50 60 70 80 90 100 : High (4a)
Percentage

   b. The intervention should be a cost effective and efficient use of MANPOWER.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (4b)
Percentage

   c. The intervention should be a cost effective and efficient use of MATERIAL RESOURCES.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (4c)
Percentage

   d. The assessment part should be a cost effective and efficient exercise.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (4d)
Percentage

Objective 5.
The strategy should elicit a profile of the child's strengths and weaknesses in the cognitive area, the affective area, and the physical area.

1. Firstly, make your judgement about this objective as a whole. (5T)

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

2. Now make the same judgement about the following aspects of this objective.

a. The strategy should elicit a profile in the COGNITIVE AREA.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (5a)
Percentage

b. The strategy should elicit a profile in the affective/emotional area.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (5b)
Percentage

c. The strategy should elicit a profile in the Physical/health area.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (5c)
Percentage

Objective 6.
The strategy should seek to improve the child's attainments and mastery in reading.

1. Firstly, make your judgement about this objective as a whole.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (6T)
Percentage

2. Now make the same judgements about the following aspects of this objective.

a. The strategy should seek to improve the child's attainments in reading.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (6a)
Percentage

b. The strategy should seek to improve the child's mastery in reading.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (6b)
Percentage

Objective 7.
The strategy should seek to improve the child's perception of the value of reading, their motivation to read, and their self-confidence in reading.

1. Firstly, make your judgement about this objective as a whole.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (7T)
Percentage

2. Now make the same judgements about the following aspects of this objective.

a. The strategy should seek to improve the child's perception of the value of reading.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (7a)
Percentage

b. The strategy should seek to improve the child's motivation to read.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (7b)
Percentage

c. The strategy should seek to improve the child's self-confidence in reading.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High (7c)
Percentage

Objective 8. (8)
The strategy should allow for a clearly stated intervention that would allow for the practice and consolidation of the skills being taught in the remedial setting into the whole area of school life.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

Objective 9. (9)
The strategy should allow for a clearly stated intervention that would allow for the practice and consolidation of the skills being taught in the remedial setting into the home setting.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

Objective 10. (10)
The strategy should be such that it allows for various intensities and degrees of intervention.

Low: 0 10 20 30 40 50 60 70 80 90 100 :High
Percentage

APPENDIX 2.3

ASSESSMENT QUESTIONAIRE & INSTRUCTIONS.

ASSESSMENT QUESTIONNAIRE

You will find enclosed with this questionnaire an assessment report on a child that will be used as the starting point for the child's attendance at a special unit for children with learning (reading) difficulties, run by Child Guidance.

We are interested in your subjective opinion about the assessment in an attempt to see how well the assessment meets certain given objectives. You will be asked to judge the extent to which, in your opinion, these objectives have been achieved on the basis of the information that you will have at your disposal.

You will be asked to do this by making a judgement on a 10 point scale, thus:

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met

Objective 1

The assessment should seek information about the child from a variety of different, yet relevant sources.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met

Objective 2

The assessment should be such that it will allow for continuous and on-going monitoring - allowing for feedback that will lead to monitored change.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met

Objective 3

Information should be gathered in the assessment about social and environmental factors that may influence the child's functioning.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met.

Objective 4 (D)

The assessment should be a cost effective and efficient exercise.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met.

Objective 5

The assessment should elicit a profile of the child's strengths and weaknesses in the cognitive,affective,and physical area.

5(T) Make a judgement about the objective as a whole.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met.

5(A) The assessment elicits a profile of child's strengths and weaknesses in the COGNITIVE area

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met.

5(B) The assessment elicits a profile of child's strengths and weaknesses in the AFFECTIVE area.

0 1 2 3 4 5 6 7 8 9 10

5(C) The assessment elicits a profile of the child's strength and weaknesses in the PHYSICAL area.

0 1 2 3 4 5 6 7 8 9 10

Objective has not been met at all — Objective has been fully met.

Comments: Please add any comments you may wish to make.

NOTE: 5(T),5(A),5(B),5(C) are used to refer to the identifiers used to initially label objectives as being part of the GLOBAL or REFINED set. They are presented here for comparative purposes but appeared on the questionnaire issued to Experts as 5(i),5(ii),5(iii), 5(iv) in order not to cause confusion or misunderstanding.

APPENDIX 2.4

INTERVENTION QUESTIONAIRE & INSTRUCTIONS.

INTERVENTION QUESTIONNAIRE

You will have available to you information about the child's progress in the unit for children with learning disabilities. This takes the form of:

a) Assessment information (testing etc.)
b) Teacher questionnaire.
c) Parent questionnaire.
d) Any other relevant information.

There are certain specific objectives that have been set and you will be asked to judge in your opinion, the extent to which these objectives have been achieved, on the basis of the information that you will have at your disposal.

You will be asked to do this by making a judgement on a 10 point scale, this:

0 1 2 3 4 5 6 7 8 9 10
Objective has not been met at all. — Objective has been totally met.

Objective 1.

The intervention should be cost effective and an efficient use of limited resources.

1.1 Make a judgement about this objective as a whole. **(Objective 4 (T))**

0 1 2 3 4 5 6 7 8 9 10
Objective has not been met at all. — Objective has been totally met.

1.2 The intervention should be a cost effective and efficient use of time available. **(Objective 4(A))**

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. — Objective has been totally met.

1.3 The intervention should be a cost effective and efficient use of manpower. **(Objective 4(B))**

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. — Objective has been totally met.

1.4 The intervention should be a cost effective and efficient use of material resources. **(Objective 4(C))**

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. — Objective has been totally met.

Objective 2.

The intervention should seek to improve the child's attainments and mastery in reading.

2.1 Make a judgement about this objective as a whole. (Objective 6(T))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

2.2 The intervention should seek to improve the child's attainments in reading. (Objective 6(A))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

2.3 The intervention should seek to improve the child's mastery in reading. (Objective 6(B))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

Objective 3.

The intervention should seek to improve the child's perception of the value of reading, their motivation to read and their self confidence in reading.

3.1 Make a judgement about this objective as a whole. (Objective 7 (T))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

3.2 The intervention should seek to improve the child's perception of the value of reading. (Objective 7 (A))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

3.3 The intervention should seek to improve the child's motivation to read. (Objective 7(B))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

3.4 The intervention should improve the child's self confidence in reading. (Objective 7(C))

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

Objective 4. (Objective 8)

The intervention should allow for the practice and consolidation of the skills taught in the remedial setting into the whole area of school life.

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

Objective 5. (Objective 9)

The intervention should allow for the practice and consolidation of the skills taught in the remedial setting into the home setting.

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

Objective 6. (Objective 10)

The intervention should be such that it allows for various intensities and degrees of intervention.

0 1 2 3 4 5 6 7 8 9 10
Objective not met at all. Objective has been totally met.

Comments: Please add any comments you may wish to make.

NOTE : The objective numbers in brackets refer to the identifiers used to initially label the objectives as being part of the GLOBAL or REFINED set. They are inluded here for comparative purposes and did not appear on the questionnaire issued to Experts.

APPENDIX 2.5

INTERVENTION INFORMATION - SUMMARY SHEETS.

STANDARDISED TEST SCORES - SUMMARY.

Child: .....

Below are standardised test scores on two separate occasions for the above child.

	1st Testing	2nd Testing
DATE		
TIME LAPSE BETWEEN TESTING		
CHRON. AGE:		
BURT W.R.T..		
NEALE ANALYSIS ACC.		
COMP.		
SPELLING TEST (specify)		
OTHER TESTS (specify) 1.		
2.		
3.		
4.		
5.		
6.		
7.		

SUMMARY INFORMATION SHEET - TEACHERS.

Child: .....

Teachers were sent a questionnaire regarding their perceptions of the child's progress on two occasions. This sheet gives their responses over the time period covered by the two questionnaires.

Date of 1st Questionnaire - [ ]

Date of 2nd Questionnaire - [ ]

Time Period Covered - [ ]

1. How good do you consider the child's mechanical reading ability is?
Make a judgement by assigning a score on this 10 point scale.
Mark X at a point from 0 - 10.

0 1 2 3 4 5 6 7 8 9 10

The child cannot read at all.

The child has totally adequate mechanical reading skills for his/her age.

2. To what extent does the child understand the passages he/she is asked to read?
Make a judgement as before on the line.

0 1 2 3 4 5 6 7 8 9 10

The child has no comprehension at all of age appropriate passages.

The child has complete understanding of all age appropriate passages.

3. To what extent does the child have a perception of the value of reading to him/her.

0 1 2 3 4 5 6 7 8 9 10

Nil.
The child perceives no value at all in reading.

Total.
The child perceives all the relevant values of reading.

4. To what degree does the child have confidence when reading?
Make judgement as before on the line.

0 1 2 3 4 5 6 7 8 9 10

Nil.
No confidence at all in reading.

Total.
Complete confidence in reading.

5. Do you have any contact with staff associated with the special unit?
If so, then:

i. Who with?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

ii. How often?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

iii. What form does the contact take?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

6. Is there any attempt to relate the work that he/she does in the special unit with what you do with him in school?
If so, then:

i. What form does the relationship take?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

ii. Do you see or correct any work he does at the unit?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

7. Make comments about the child in relation to the following aspects of school life from your experience.

i. Reading

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

ii. Number Work

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

You will have seen the remarks made by
Class Teacher regarding his involvement with the special Child Guidance unit.
Please add any comments of your own that you feel will be helpful in filling out the picture.

Questionnaire 1.

Questionnaire 2.

Signed .....

Head Teacher .....

SUMMARY INFORMATION SHEET - PARENTS.

Child: .....

The parents were sent a questionnaire regarding their perceptions of their child's progress on two occasions. This sheet gives them responses over the time period covered by the two questionnaires.

Date of 1st Questionnaire - [ ]

Date of 2nd Questionnaire - [ ]

Time Period Covered - [ ]

1. What is your opinion about your child's ability to read at the moment?

0 1 2 3 4 5 6 7 8 9 10

Cannot read at all. Can read perfectly for their age.

2. When your child attempts to read, how much do you think he/she understands what he/she is reading?

0 1 2 3 4 5 6 7 8 9 10

No understanding at all of all he/she reads. Complete understanding of all he/she reads.

3. Do you think your child has any understanding of the value of being able to read?

0 1 2 3 4 5 6 7 8 9 10

No understanding at all of the value of reading. Complete understanding of the value of reading.

4. To what extent do you think your child is motivated to try and read?

0 1 2 3 4 5 6 7 8 9 10

No motivation at all to try and read. Total motivation to try and read.

5. How much confidence in themself does your child have when he/she attempts reading?

0 1 2 3 4 5 6 7 8 9 10

No confidence at all when attempting reading. Complete confidence when attempting reading.

Could you now answer this additional question directly, by simply filling in your answers:

6. Do you have any contact with staff associated with the special unit?

If so, then:

a. Who with?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

b. How often?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

c. What do they do with you?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

7. Is there any attempt to involve you at home with the work that your son/daughter is getting at the special unit?
e.g. homework/assignments etc.

If so, then:

a. What do you do?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

b. How often?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

c. Do you regularly see the work he/she is getting?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

8. Do you feel that you are being involved in any way with helping your child overcome their reading difficulty?

If so, then:

a. Describe in what way you feel involved.

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

9. Are there any other comments that you would like to make at this point about the help being given?

FIRST QUESTIONNAIRE COMMENTS	
SECOND QUESTIONNAIRE COMMENTS	

APPENDIX 2.6

TEACHER & PARENT QUESTIONAIRES USED TO CREATE SUMMARY QUESTIONAIRES ON INTERVENTION.

Teacher Questionnaire

Child's Name:

Address:

Date of Birth:

School: Class:

Teacher: Date:

The above child is about to/is receiving extra help for learning difficulties from the unit at the Child Guidance Centre. To help us give the child the best possible help, it is important to have comments from the class teacher. Please answer the following questions about the child as honestly as you can, and also about your opinion about the help being given.
You will be asked to complete this questionnaire at regular intervals so that the child's progress can be monitored. The questions are to a great extent opinionative in nature, and you will be asked to make judgements based on your knowledge of the child.

1. How good do you consider the child's mechanical reading ability is?
Make a judgement by assigning a score on this 10 point scale.
Mark X at a point from 0 - 10.

0 1 2 3 4 5 6 7 8 9 10

The child cannot read at all.

The child has totally adequate mechanical reading skills for his/her age.

2. To what extent does the child understand the passages he/she is asked to read?
Make a judgement as before on the line.

0 1 2 3 4 5 6 7 8 9 10

The child has no comprehension at all of age appropriate passages.

The child has complete understanding of all age appropriate passages.

3. To what extent does the child have a perception of the value of reading to him/her?

0 1 2 3 4 5 6 7 8 9 10

Nil.
The child perceives no value at all in reading.

Total.
The child perceives all the relevant values of reading.

3. To what degree does the child <u>have confidence</u> when reading.
Make judgement as before on the line.

0 1 2 3 4 5 6 7 8 9 10

<u>Nil.</u>
No confidence at all in reading.

<u>Total</u>
Complete confidence in reading.

4. Do you have any contact with staff associated with the special unit?
If so, then:

i. Who with?

ii. How often?

iii. What form does the contact take?

5. Is there any attempt to relate the work that does in the special unit with what you do with him in school?
If so, then:

i. What form does the relationship take?

ii. Do you see or correct any work he does at the unit?

6. Make comments about in relation to the following aspects of school life from your experience.

i. Reading

ii. Number Work

iii. Other Class Work

iv. Project Work

v. Relationships with Other Children

vi. Relationships with Staff

vii. Generally.

7. Any other comments you wish to make that you feel is relevant to and his/her progress.

Head Teacher's Comments

You will have seen t e remarks made by
Class Teacher regarding his involvement with the special Child Guidance unit.
Please add any comments of your own that you feel will be helpful in filling out the picture.

Signed

Head Teacher

PARENT QUESTIONNAIRE

Child's Name: Date:

Date of Birth:

Address:

School: Class:

As you will know, your son/daughter is attending the special unit at the Child Guidance Centre in order to receive extra help with his/her reading difficulties. In order to help us give him/her the best possible help, it is important to have the parents views and comments.

We would appreciate it if you could answer the following questions as honestly as you can. Don't be afraid to be critical if you feel it is justified. It is only in this way that we can hope to improve the service we give to all children referred with this kind of difficulty.

You will be asked your opinion about certain things, and you will be asked to record your opinion as follows:
e.g. What is your opinion about your son/daughter's reading abiliyty?

0 1 2 3 4 5 6 7 8 9 10

He/she cannot read at all. He/she can read perfectly well for their age.

You can see that 0 and 10 represents two total extremes. It is unlikely that your child will be at either extreme end, and what you are asked to do is to make a judgement as to where, on this line from 0 - 10, your child's reading ability will lie. The higher the number point on the line you choose, the better you think your child's reading is, and so on.

Thus, suppose you decide that, <u>at this point in time</u>, number 3 best represents where, in your opinion, your child should be placed, you would place a X on the line at 3, thus:

X

0 1 2 3 4 5 6 7 8 9 10

You will be asked to repeat this for various questions, which you answer in the same way. You will also be asked to do the same thing every three months, so as we can obtain an idea of how your son/daughter is progressing, <u>as far as you the parents are concerned</u>.

This will help us in building a complete picture of his/her progress in the special unit.

Please consider the following questions about your son/daughter in this way now. Please try and be as honest as you can in your opinion in each case.
Thank you.

1. What is your opinion about your child's ability to read at the moment?

0 1 2 3 4 5 6 7 8 9 10

Cannot read at all. — Can read perfectly for their age.

2. When your child attempts to read, how much do you think he/she understands what he/she is reading?

0 1 2 3 4 5 6 7 8 9 10

No understanding at all of all he/she reads. — Complete understanding of all he/she reads.

3. Do you think your child has any understanding of the value of being able to read?

0 1 2 3 4 5 6 7 8 9 10

No understanding at all of the value of reading. — Complete understanding of the value of reading.

4. To what extent do you think your child is motivated to try and read?

0 1 2 3 4 5 6 7 8 9 10

No motivation at all to try and read. — Total motivation to try and read.

5. How much confidence in themself does your child have when he/she attempts reading?

0 1 2 3 4 5 6 7 8 9 10

No confidence at all when attempting reading. — Complete confidence when attempting reading.

Could you now answer this additional question directly, by simply filling in your answers:

6. Do you have any contact with staff associated with the special unit?

If so, then:

a. Who with?

9. Are there any other comments that you would like to make at this point about the help being given?

Signed: _____

Thank you for taking the time to complete this.
It will help us to improve the help we are trying to give to your child.

b. How often?

c. What do they do with you?

7. Is there any attempt to involve you at home with the work that your son/daughter is getting at the special unit?
e.g. homework/assignments etc.

If so, then:

a. What do you do?

b. How often?

c. Do you regularly see the work he/she is getting?

8. Do you feel that you are being involved in any way with helping your child overcome their reading difficulty?

If so, then:

a. Describe in what way you feel involved.

APPENDIX 2.7

MULTIMODAL GUIDED INTERVIEW SCHEDULES - CHILD, TEACHER, PARENT.

Multimodal Guided Interview Schedule:

Child's Name: Date of Birth:

Address: Age:

School: Class:

Teachers:

Date Schedule Completed:

Comments:

Psychologist:

Child's Name:

Behaviour Modality

Child

1. Is there anything about the way you behave that you would like to change?

2. Is there anything you do that you are specially proud of?

3. What would you like to do more of?

4. What would you like to do less of?

5. What would you like to start doing?

6. What would you like to stop doing?

7. What do you like doing best at school?

8. What do you like doing best at home?

9. What do you like doing least at school?

10. What do you like doing last at home?

11. How do you spend your spare time?

12. Any further comments regarding child's behaviour?

Child's Name:

Affective Modality

1. Let's make a list of the things that frighten you most.

   a.

   b.

   c.

   d.

   e.

2. Let's make a list of the things that make you really happy.

   a.

   b.

   c.

   d.

   e.

3. What feelings would you like to have more often?

4. What feelings would you like to have less often?

5. When are you most likely to lose control and get really upset?

6. Can you think of an incident wwhen you have been very upset/frightened/worried, etc.

Let's try and look at this incident in greater detail.

7. Finish the following sentences that I have started:

a. When I get really angry ...

b. If I am worried about school ...

c. I am most happy ...

d. I get very scared ...

e. It makes me sad ...

f. Right now I feel ...

g. In class at school I usually feel ...

h. I feel guilty about ...

i. (presenting problem) makes me feel ...

j. At home I usually feel ...

Child's Name:

Feelings Checklist

Below there are a list af words that people sometimes use to describe how they feel inside. We all have these feelings from time to time, some more so than others. What we want to know is how often you experience these feelings. What we will do is choose from five possibilities.

Never - Scores 0
Rarely - Scores 1
Sometimes - Scores 2
Quite a lot - Scores 3
Nearly all the time - Scores 4.

I'll read the word, and you decide which of these five is most applicable to you.

Word(s)	Score
1. Angry	
2. Annoyed	
3. Sad	
4. Fed up	
5. Anxious	
6. Worried	
7. Panicky	
8. Guilty	
9. Happy	
10. Relaxed	
11. Jealous	
12. Unhappy	
13. Bored	
14. Restless	
15. Lonely	
16. Excited	
17. Confused.	

Child's Name:

Sensory Modality Child

It will be necessary to spend some time in an informal discussion of what is meant by this modality.

1. I am going to go through a list of sensory experiences, and I want you to tell me if you experience any of these sensations quite a lot. (Elaborate where necessary)

   a. Headaches

   b. Dizzy turns

   c. Very rapid heart beat (palpitations)

   d. Upset tummy

   e. Tingling sensations

   f. Numbness of fingers/toes

   g. Tired very easily

   h. Sore tummy

   i. Sore back

   j. Twitching hand

   k. Faiting

   l. Eyes watering

   m. Blushing

   n. Skin rashes

   o. Dry mouth

   p. Sweating a lot

   q. Singing in ears

   r. Itching

   s. Hot flushes.

   Elaboration (as required)

2. Are there any sensations that you have that have not been mentioned?

3. Can you think of any physical sensations you find particularly pleasant?

4. Can you think of any physical sensations you find particularly unpleasant?

Child's Name;

Imagery Modality

It will probably be necessary to spend time on an informal discussion of what is meant by this modality.

1. Do you have a good/vivid imagination?

2. What mental pictures come into your mind most often?

3. Describe a very pleasant mental picture that you have.

4. Describe a very unpleasant mental picture you may have.

5. Describe your image of a totally "safe place" where you could go and nothing would harm you.

6. If I say the word "school" what mental picture comes into your mind?

7. If I say the word "have" what mental picture comes into your mind?

8. Do you often have nightmares? If so, can you describe them?

9. What mental pictures do you associate with these people? :

a. Mother

b. Father

c. Brother

d. Sister

e. Teacher

f. Best friend

g. Enemy.

10. Do any of the following apply to you? (Elaborate if necessary)

a. I can imagine myself being hurt?

b. I can imagine myself hurting other people.

c. I can imagine myself not coping at school.

d. I can imagine myself doing well at school.

e. I can imagine myself being laughed at.

f. I can imagine myself being talked about.

g. I can imagine myself failing.

h. I can imagine myself being popular with my friends.

i. I can imagine myself being sad and lonely.

j. I can imagine myself being happy and carefree.

Child's Name:

Cognitive Modality Child

An initial discussion and explanation surrounding the role of thought processes and how they influence behaviours and can create problems of themselves may be necessary.

1. Read through the following list and ask child which ones are applicable. I am going to suggest various thoughts that children sometimes have about themselves; I want you to tell me if any of them are thoughts that you might have from time to time. (Elaborate if necessary)

   1. I am worthless
   2. I am useless
   3. I am unattractive
   4. I am stupid
   5. I am intelligent
   6. I am confident
   7. I am worthwhile
   8. I am evil
   9. I am lovable
   10. I am honest
   11. I am incompetent
   12. I have a bad memory
   13. I am hard working
   14. I am lazy
   15. I am a nobody
   16. I have horrible thoughts
   17. I am sensitive
   18. I am loyal
   19. I am confused
   20. I am ugly
   21. I suffer from poor concentration
   22. Life is empty
   23. Life has nothing to look forward to

24. I make too many mistakes

25. I never do anything right

26. Life is always exciting

27. I am boring

28. I enjoy every day of life very much

29. I will never be able to do any school work

30. I can't be bothered with school.

Elaboration (if necessary)

2. What is your silliest thought or idea?

3. Are you bothered by thoughts that occur over and over again?

4. If you are given extra help for your difficulties, what do you expect will happen?

5. Will you be required to do anything for yourself?

6. What do you think about your teachers?

7. What do you think about your parents?

8. Complete the following sentences:

   a. The person in the best position to help me is ...

   b. Having problems at school is ...

   c. School is ...

   d. Home is ...

   e. Talking to you (psychologist) is ...

Comments

Child's Name

Irrational Thoughts Checklist

Below there is a list of statements that people sometimes think about themselves. We all think these thoughts from time to time. What we want to know is how much you agree with these statements about yourself. What we will do is choose from five possibleties.

Strongly Disagree - scores 0

Disagree - scores 1

Neutral - scores 2

Agree - scores 3

Strongly Agree - scores 4

I'll read the statement and you decide which of the five is most applicable to you.

Statements	Score
(1) I should not make mistakes	
(2) I should be good at everything I do.	
(3) If I do not know something, I should pretend that I do.	
(4) I have no control over my life.	
(5) Everyone else is happier than me.	
(6) It's important to please other people all the time.	
(7) I should never take risks with my life.	
(8) I don't deserve to be happy.	
(9) If I ignore my problems they will go away	
(10) I should always strive to be perfect.	
(11) There are only 2ways of doing things - the right or the wrong way.	
(12) I should always try to make other people happy.	

Child's Name:

Interpersonal Modality. Child.

1. Are you able to talk easily to your parents about your problems?

2. Which parent do you normally go to with your problems?

3. Can you talk about your problems with your borthers/sisters?

4. Do you think your parents understand you?

5. How do your parents punish you if you do wrong?

6. Are you often unhappy at home?

7. Who are the most important people in your life?

8. Who are your best friends?

9. Do you make friends easily?

10. Do you keep your friends quite readily?

11. Do you get bullied or teased by other children?

12. Describe a relationship with a friend that makes you very happy.

13. Describe a relationship with someone that makes you very unhappy.

14. Do you have any friends that you can talk to about your problems?

15. Do you always try to get other children to do what you want them to do?

16. Do you tend to do what other children want to do?

17. Do you often get left out of games and sports?

18. Do you think other children like you?

19. If you could choose to be someone else, who would it be?

20. Is there anything about your relationships with other people that you would like to change?

Comments:

Sentence Completion.

Complete the following sentences that I will start for you.

1. When I am with other children at school ...

2. When I am with my family at home ...

3. When I am with a group of children I do not know I feel ...

4. Friends should ...

5. Parents should ...

6. Brothers and sisters should ...

7. My teacher at school makes me feel ...

8. Other people ...

Child's Name:

Health Modality. Child.

1. Summary of any general and relevant medical information readily available on the child.

2. General subjective observations about the child's stage of health and physical appearance.

3. Medication (Regular), if applicable.

4. Do you think that you keep well most of the time?

5. Do you feel physically fit and well?

6. Do you play any games or sports regularly? (specify)

7. What are your five favourite foods?

   a.

   b.

   c.

   d.

   e.

8. What do you get to eat typically at the following times?

   a. Breakfast

   b. Lunch

   c. Tea/Dinner

9. Do you eat between meals regularly?

10. Do you smoke regularly?

11. Have you ever taken drugs?

12. Have you ever sniffed glue?

Comments:

Child's Name:

Modality Summary Sheet.

1. Behaviour Modality.

General:

Main Points

2. Affective Modality.

General:

Main Points

3. Sensory Modality.

General:

Main Points

4. Imagery Modality.

General:

Main Points

5. Cognitive Modality.

General:

Main Points

6. Interpersonal Modality.

General:

Main Points

7. Health Modality.

General:

Main Points

7. Health Modality

General:

Main Points

Date Profile Completed:

Re-assessment Profile on:

Signed:

Child's Name;

Modality - Action Summary Sheet

Modality	Main Points	Proposed Action

Modality	Main Points	Proposed Action

Multimodal Assessment Schedule:

Class Teacher:

Child's Name: Date of Birth:

1 Behaviour Modality:

General:

Main Points:

2 Interpersonal Modality :

General:

Main Points:

Child's Name:

Behaviour Modality. Teacher.

1. Below you will see listed a series of behaviours that may prove difficult in a classroom situation. Please underline any that you feel are applicable to this child.

   a. Concentration problems

   b. Disruptive

   c. Aggressive

   d. Withdrawn

   e. Lazy

   f. Crying a lot

   g. Quick tempered

   h. Poor self control

   i. Over controlled

   j. Child too timid

   k. Compulsive behaviour (specify)

   l. Odd behaviour (specify)

2. Any other behaviours not mentioned above that you may wish to mention

3. In terms of overt behaviours, what do you see as the child's main difficulties?

4. What, in your opinion, should the child do more of?

5. What in your opinion, should the child do less of?

6. Do you have any other comments regarding the child's behaviour?

Child's Name:

Interpersonal Modality. Teacher.

1. Have you met the child's parents?

2. What are your subjective impressions about them?

3. Regarding the child's school work, do you feel that there is muc support coming from home for what the school is trying to achieve?

4. How does the child get on with other children in the class?

5. How does the child get on with other children in the school in general?

6. Who, in school, seems to be his/her friends?

7. Does the child make friends easily?

8. Does the child keep friends easily?

9. Would you say that he/she was a leader or a follower in the peer group?

10. How does the child get on with adults in the school?
(e.g. teachers, auxilliaries, etc.)

11. Is there anything that you feel this child would do well to change, that might help relationships with other people?

Comments:

Multimodal Assessment Schedule:

Parent:

Child's Name:

Date of Birth:

Behaviour Modality:

General:

Main Points:

(2) Sensory Modality:

General:

Main Points:

(3) Cognitive Modality:

General:

Main Points:

(4) Interpersonal Modality:

General:

Main Points;

(5) Health Modality:

General:

Main Points:

Child's Name:

Behaviour Modality. Parent

1. Below you will see a list of behaviours that may or may not be applicable to your child. Underline any that you feel may be particularly applicable to your child.

   a. Tries too hard

   b. Lazy

   c. Overeats

   d. Impulsive

   e. Poor self control

   f. Overcontrolled

   g. Poor appetite

   h. Withdrawn

   i. Poor concentration

   j. Sleep disturbances

   k. Aggressive

   l. Cries a lot

   m. Quick tempered

   n. Bed wetter

   o. Soils himself/herself

   p. Compulsive behaviours (specify)

   q. Odd behaviour (specify)

2. Are there any other behaviours not mentioned above that you would like to mention?

3. What, in your opinion, should your child do more of?

4. What, in your opinion, should your child do less of?

5. Do you have any other comments regarding your child's behaviour?

Child's Name:

Sensory Modality — Parents

Again, it may be necessary to spend some time discussing the meaning of this modality.

1. I am going to go through a list of sensory experiences, and I want you to tell me if your son/daughter ever complains of any of these sensations to you. (Elaborate where necessary)

   a. Headaches

   b. Dizzy turns

   c. Palpitations

   d. Upset tummy/bowels

   e. Tingling sensations

   f. Numbness of fingers/toes

   g. Tired very easily

   h. Sore tummy

   i. Twitching hand

   j. Sore back

   k. Fainting

   l. Eyes watering

   m. Blushing

   n. Skin rashes (disorders)

   o. Dry mouth

   p. Sweating a lot

   q. Singing in ears

   r. Itching

   s. Hot flushes.

   Elaboration (as required)

2. Are there any senory experiences that you feel have not been mentioned.

Child's Name:

Cognitive Modality — Parents

Explain to parents how children (and adults) can often create problems for themselves by engaging in irrational thought processes.

I am going to read through various statements, and ask you to tell me if your son/daughter ever talks about themeslves to you in any of these terms. (Elaborate if necessary)

1. I am worthless
2. I am useless
3. I am unattractive
4. I am stupid
5. I am intelligent
6. I am condient
7. I am worthwhile
8. I am evil
9. I am lovable
10. I am honest
11. I am incompetent
12. I have a bad memory
13. I am hard working
14. I am lazy
15. I am a nobody
16. I have horrible thoughts
17. I am sensitive
18. I am loyal
19. I am confused
20. I am ugly
21. I suffer from poor concentration
22. Life is empty
23. Life has nothing to look forward to

24. I make too many mistakes

25. I never do anything right

26. Life is always exciting

27. I am boring

28. I enjoy every day of life very much

29. I will never be able to do any school work

30. I can't be bothered with school.

Elaboration (if necessary)

Child's Name:

Interpersonal Modality. Parents

1.Are you able to talk easily to your son/daughter about their problems?

2.Which parent will he/she tend to go to with problems?

3.How does he/she get on with other children in the family?

4.Would you say you were a close knit family?

5.How do you normally discipline your son/daughter if they do wrong?

6.Who are your son/daughter's best friends?

7.Does he/she make friends easily?

8.Does he/she keep friends readily?

9.Would you say that he/she was a leader or a follower in their peer group?

10. Does he/she get bullied to your knowledge?

11. How does he/she get on with teachers at school?

12. Is there anything that you feel your son/daughter would do well to change that might help relationships with other people?

Comments:

Child's Name:

Health Modality. Parents.

This would be considered in conjunction with a general developmental history.

1. Does your son/daughter suffer from any chronic illness or disability?

2. Is he/she on medication regularly? (specify)

3. Are there any serious heredity diseases present in the family?

4. What are your son/daughter's eating habits like?

5. What are his/her favourite foods?

6. Does he/she take any regular physical exercise or play any sports regularly? (specify)

7. Do you have any worries about your child's physical health?

Comments:

APPENDIX 3.

RESEARCH METHODOLOGY DETAILS.

CHAPTER 3 - APPENDIX

A DECISION - THEORETIC APPROACH TO EVALUATION RESEARCH

1. INTRODUCTION

This model described by Edwards, Guttentag and Snapper (1975) was basically created to facilitate decision making processes in large public agencies, who wished data regarding programme effectiveness. Consequently, they are dealing with situations where vast quantities of public monies are being utilised and the need for efficient decision making can be seen not only in a professional context, but also a political one.

The authors state their position quite firmly when they observe that - "Evaluation . . . exist (or perhaps only should exist) to facilitate intelligent decision-making." (p140)

They made the distinction between two aspects of research - what are the odds, and what is at stake?

The odds in effect refer to the chances or probability that the programme (or parts of the programme) will be effective in meeting intervention objectives, and bears most directly on research evidence. Stakes on the other hand, they believe are more the feelings of what are the gains and losses involved in the programme when comparing intervention to non-intervention, or some alternative strategy. This is the area most often seen as the domain of the decision maker, although they feel conventional research bears, at best, indirectly on this. Essentially, they seek to bring these two aspects together into one overall model of evaluation which takes account of both the odds and the stakes associated with the decisions.

It is also pointed out that evaluation must be more than simply gathering as many facts as possible about a particular programme's effectiveness. On the one hand, a mere plethora of facts may be almost as difficult to use for decision making as too few facts, while on the other, the mere collation of facts says virtually nothing about values associated with the programme. The construct of value is essentially a subjective facet of decision making, lying within the unique perceptions of each decision maker.

So, the evaluation process should seek to consider both the facts and the values associated with them.

2. DECISION - THEORETIC METHODOLOGY

It would be the intention here to outline, in general terms, the methodology applied to the process. A detailed discussion, with examples, can be found in the paper by Edwards et al (1975).

There are identified 4 phases in the decision theoretic process.

2.1 IDENTIFYING PROBLEM

Before any evaluation or intervention can be undertaken, it is clearly important to identify and define the problem, and to clearly state the objectives that any programme might be wishing to address.

2.2 PROBABILITY EVALUATION

It is seen that prior to a programme being implemented, the evaluation should seek to obtain estimates of the probability that a given programme may meet the objectives as defined - this would be termed the prior probability of objective attainment. By using estimates of

importance weightings for each objective set, the sum of the products of the weightings and the objectives will yield a value of prior subjective utility. In essence, this is a measurement of the perceived usefulness of the programme. (The example given at the end will clarify the process considerably.)

It is suggested that one method of arriving at these prior values would be to consult the opinions of those most directly involved and with the most interest in the outcome of a particular programme. It is argued that as these subjective prior probabilities are going to be revised in the light of data from the programme, that essentially it is unimportant if there is disagreement among respondants, as this will "come out in the wash", as the technique seeks to take account of competing perspectives and interests.

2.3 OUTCOME EVALUATION

Once the programme is run, then the data emanating from the programme may be used to attach values to the utility of the programme - again, this process is best demonstrated by example.

2.4 DECISION MAKING

On the basis of the outcome evaluation, a decision is made and acted upon in the knowledge that the data available has been considered in terms of values linking programme with objectives.

3. DETAIL OF METHOD

It would seem appropriate at this point to elaborate the process in a step by step fashion. To clarify each step I will give an example as

to how it might relate to the issue of children with learning disabilities.

Step 1

Identify the person, persons or organisation who have a vested interest in the implementation of a programme, and who therefore will have an interest in the decisions that might ultimately be made.

Example: With L.D. children this would include:

- teachers
- psychologists
- parents
- children themselves
- Child Guidance Service
- Education Department

Step 2

Clarify the issue about which the decision is to be made. This may be a programme or programmes of intervention that may be implemented to address a given problem.

Example: With L.D. children this might include:

- a novel remedial strategy
- a wholly in-class programme
- a residential programme

Step 3

Clarify what are perceived are possible outcomes of any given intervention.

Example: With L.D. children these may be:

- an improvement in their reading ability
- no change in their reading ability
- a deterioration in their abilities

Step 4

Identify the objectives of any given intervention. This may be done by group discussion with interested parties or potentially by simply nominating objectives with face validity. Clearly the broader and more representative is the process used in establishing these objectives, the more desirable it is.

Example: With L.D. children such objectives may include:

- significantly improve their reading
- increase their general self esteem
- provide class teachers with support in dealing with such problems

Step 5

Rank the identified objectives in order of importance. This can be performed either by an individual or by group consensus. The individual process will indubitably produce differing opinions whereas the group method is more likely to lead to consensus.

Example: With L.D. children - supposing 5 objectives had been agreed (01 - 05), then they might be ranked:

03 - most important

04

01

05

02 - least important

Step 6

Rate and weight the objectives in their ranked order, preserving ratios. This is done by arbitrarily assigning the least important objective a weighting of 10. The question is then asked -

- How much more important do you feel the next most important objective is compared to the least important one?

The second most important objective is then assigned a weighting that reflects this ratio.

Eg.: If it is seen as twice as important then it would be weighted 20 (ie. 2 x 10)

The same question would then be asked of the next objective in the hierarchy in relation to the one below it, and so on to the top of the ranking.

Again this can be done at an individual level, or as a matter of group consensus.

Example: With the L.D. children example given in Step 5 this may result in:

Objective		Weighting	
03	-	90	
04	-	90	Equal importance
01	-	30	3 x important
05	-	15	2 x important
02	-	10	1½ x important

Step 7

Assign a probability value to the likelihood of each objective being met by a given intervention programme. This step would represent a subjective opinion on the part of a series of individuals with face validity in this area, or a group view arrived at by a representative cross section of those with interest and knowledge in the area.

Example: With the L.D. children example being used, supposing one intervention strategy I was being tried, we may have prior subjective probabilities along the following line:

P_I (03) = 0.5 (ie. 50% probability that I might meet objective 3)

P_I (04) = 0.7

P_I (01) = 0.15

P_I (05) = 0.6

P_I (02) = 0.3

Step 8

Calculate the prior subjective utilities for each objective. This is done by obtaining the product of the probability with the appropriate weight. Then calculate the prior subjective utility for the whole programme. This is obtained by summing all the individual utilities.

Example: With the L.D. children example this would lead to:

Objective	Weighting	Probability	Utility
03	90	0.5	45
04	90	0.7	63
01	30	0.15	4.5
05	15	0.6	9
02	10	0.3	3
		Utility (I) =	124.5

Step 9

On the basis of the prior subjective utilities, the rule is relatively straightforward - maximise the utility value, and this will be the most appropriate course of action based on a balanced, weighted consideration of all the objectives in relation to the programmes likelihood of achieving them.

Example: With L.D. children, supposing 3 different programmes were being considered; P, I and B, and the calculated utilities were as follows:

U (P) = 96.4

U (I) = 124.5

U (B) = 67.5

It would then suggest that programme I would be the one to impliment.

Step 10

In a situation where various programmes were to be implimented on a trial basis, then it would be possible to revise the prior subjective probabilities after a period of time by considering data which comes in for the programmes themselves. This may be done by asking for probabilities to be assigned to the appropriate objectives on the basis of the evidence coming in from the field trials. Using the same methodology as before, the utility values may be revised on the basis of these new probabilities. Such reviews of probabilities and utilities may continue to be made over appropriate time intervals, thus continually revising the utilities on the basis of experience in the field.

Example: With the L.D. children example, supposing the 3 programmes P, I and B were implemented over an extended period. We may get an outcome like the following:

		Posterior Utilities		
	Prior Utility	6 Month	1 Year	18 Month
Prog. P	96.4	84.5	80	82.5
Prog. I	124.5	130.5	136.3	133.3
Prog. B	67.5	90.5	120.4	130

This data would suggest that although programme I still appears to be the best, programme B shows considerable improvement over time, and maybe worth closer attention.

APPENDIX 4.

EXAMPLES OF MULTIMODAL ASSESSMENTS IN OTHER CONTEXTS.

MULTIMODAL ASSESSMENT OF ADOLESCENT REFERRED BY CHILDREN'S HEARING SYSTEM FOR COMMUNITY ASSESSMENT.

Department of Education
Ayr Division

Child Guidance Centre
2 Donaldson Avenue
Saltcoats
Tel Saltcoats 63495

Strathclyde Regional Council

MULTIMODAL PROFILE.

Child's Name: .....

Address: .....

D/B: ..... Chronological Age: .....

School: ..... Class: .....

Teacher: ..... Psychologist: .....

Date: .....

Suggested Review: .....

The multimodal profile of a child considers a framework on which a child's whole functioning can be considered. The seven areas or modalities are not meant to be mutually exclusive, and independent areas of functioning, and inevitably some overlap will be apparent. Six of the modalities (Behaviour, Affect, Sensation, Imagery, Cognitive Processes, Interpersonal Relationships) are psychological constructs built on the seventh modality, (Health) which represents the child's physiological/ biological base.

This method of describing a child's functioning gives a valid framework on which to consider intervention/remediation strategies.

T. E. Williams, Senior Psychologist.

MULTIMODAL PROFILE.

The Multimodal Report considers the child's psychological functioning across the seven major modalities. The layout of the report follows in a logical and sequential fashion as follows:

PROBLEM DEFINED → **PATTERN OF PROBLEM** → **CONSEQUENCES**

(detailed description of main problem areas across seven modalities).

(How and in what situations the problems occur).

(what is the consequence for child and others of the problem as outlined).

→ **INTERVENTION STRATEGIES** → **INTERVENTION RECOMMENDATIONS**

(across the seven modalities are there interventions that are psychologically appropriate).

(A generalised recommendation which takes into account all aspects of the child's functioning).

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Problem.	(1) Gross forms of attention seeking behaviour e.g. wild tantrums; behaviours that may be potentially self injurious. (2) "Coldly" aggressive towards others. (3) Disruptive in structured situations - especially school (4) Truancy. (5) General amoral and anti-social behaviour.	(1) Subject to wild mood —emotional swings - highly excitable/ distressed - morose and uncommunicative (2) Uncontrolled anger (3) Sadness (4) Generally emotionally deprived and immature (thumb sucker)	Nothing noted.	Appears to have developed no coherent self image - dominance of aggressive images. "punching people" "kicking people" Offers no pleasant mental images.	Thought Processes. Nothing particular noted, but generally content of thought seems very shallow. Intellectual Low/average I.Q: WISC-R F.S. I.Q. = 91 Attainments very poor. Reading and number work at basic/elementary stage. History of referral for educational problems.	(1) Lack of stable family relationships (2) Lack of normal adaptive social skills (3) Highly antagonistic to peers and adults.	No special problems noted.
Pattern of Problem.	(1) In all & (3) situations where controls are imposed e.g. school children's home. (2) When he doesn't get his own way with others. (5) Behavioural excesses, are a major feature of his life.	Emotional outbursts tend to be unpredictable, but especially when demands are made of him.	———	"negative" images tend to dominate in his life.	Thought Processes In all areas of his life. Intellectual In all formal educational settings.	1, 2 & 3. All aspects of his highly unadaptive social development are major determinant of behavioural and emotional problems.	———

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Consequences.	David's life staggers from one behavioural crisis to the next. Social isolation. No stability made possible.	David is in danger of developing into a highly emotionally disturbed young person. Lack emotional equilibrium.	_____	Producing a very "negative" view of life.	Cognitive and educational development seriously being impaired.	David is becoming increasingly dislocated from social norms, - danger of developing grossly anti-social attitude to others.	_____
Intervention Strategies.	Behavioural contracting, in a setting that can still tolerate wild behavioural excesses.	Therapeutic and tolerant mileau, that will gradually foster emotional stability.	_____	Strategies that will develop more positive images of self and life in general.	Small group and individualised remedial teaching.	Social skills training in an environment that will prove secure and supportive.	_____
Intervention Recommendations	David's problems are such that individual focussing on specific areas will bear no fruit until some stability enters his life. It seems clear that the family cannot offer this, and I would recommend that appropriate residential placement be sought that might be able to offer intervention strategies along the lines outlined above.						

MULTIMODAL ASSESSMENT OF CHILD IN RESIDENTIAL CARE IN SCHOOL FOR MALADJUSTED CHILDREN - USED AS PART OF INTERDISCIPLINARY PROGRAMME PLANNING.

Department of Education
Ayr Division

Child Guidance Centre
2 Donaldson Avenue
Saltcoats
Tel Saltcoats 63495

Strathclyde Regional Council

MULTIMODAL PROFILE.

Child's Name: .....

Address: .....

D/B: ..... Chronological Age: .....

School: ..... Class: .....

Teacher: ..... Psychologist: .....

Date: .....

Suggested Review: .....

The multimodal profile of a child considers a framework on which a child's whole functioning can be considered. The seven areas or modalities are not meant to be mutually exclusive, and independent areas of functioning, and inevitably some overlap will be apparent. Six of the modalities (Behaviour, Affect, Sensation, Imagery, Cognitive Processes, Interpersonal Relationships) are psychological constructs built on the seventh modality, (Health) which represents the child's physiological/ biological base.

This method of describing a child's functioning gives a valid framework on which to consider intervention/remediation strategies.

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(detailed description of main problem areas across seven modalities).

(How and in what situations the problems occur).

(what is the consequence for child and others of the problem as outlined).

→ **INTERVENTION STRATEGIES** → **INTERVENTION RECOMMENDATIONS**

(across the seven modalities are there interventions that are psychologically appropriate).

(A generalised recommendation which takes into account all aspects of the child's functioning).

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School:- Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Problem	1. Temper outbursts. 2. Running away. 3.?Sexual Promiscuity. 4. Verbally abusive and aggressive. 5. Will not sit. and attend to school work. 6. Bites nails.	1. Lack of self control in expressing her feelings - anger - mixed emotions re: parents - guilt.	1. Occasional psychosomatic symptoms - sore stomach	1. Very poor self image. 2. No positive future image of herself.	(A) Does not work to intellectual potential.	1. Ambivalent relationship with mother and father. 2. Superficially dominant with peers. 3. Easily led by others.	1. Smokes 2. Bad stomach?
Problem History	1.& 4. When she doesn't get her own way. 2. When she craves attention and after visiting mother. 3. In the company of older male or female. 5. In class at all times. 6. All the time.	1. When staff demands and restrictions are made of her. 2. When visiting either parent on occasions.	1. No particular patterns.	1 & 2. Permeates all aspects of her life.	Demand from teacher in class situation.	1. When she meets them and talks about them. 2. Most of the time. 3. Especially when on the run.	1. Most of the time. 2. On one occasion.

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Consequences	1, 2 & 4. Loses privileges - ties up staff time. 3. pregnancy danger. 5. Is not achieving academically as she might. 6. Messy and unattractive hands.	Seriously inhibits growth she can make in Southannan Fights with parent(s).	Unnecessary hospitalisation	No sense of direction in her life.	Does not gain the benefit from education that she might.	1. Blow ups and running off. 2. Comes over as more aggressive than is the case - could put other youngsters off. 3. Moral danger.	1. Poor health standards.
Intervention Plan.	1, 2&4. Behavioural contracting. 3. Counselling. 5. Vocationally concentrated curriculum. 6. Health education project.	Allow her "space" to act out her behaviours with unconditional staff support - counselling.	Medical check. - counselling.	- counselling - working with pre-school children's group to give her a sense of purpose.	- working with children. - use this motive as a springboard to encourage academic work - remedial as necessary.	1. Counselling with Sandra, Mother and Father. 2. Social Skills programme. 3. Counselling. 4. Life "Book".	1. Health education project.
Intervention Goals.	1, 2 & 4. Sandra should be able to control her behaviours and not run off. 3. Remove risk of moral danger. 5. Have her work to her capacity and interests. 6. Take a healthy view of her appearance.	Allow her to "own" and express her feelings in a therapeutic and acceptable manner that will allow for psychological growth.	Remove psychco-somatic symptoms.	Produce a positive and constructive self image.	Achieve to her potential academically.	1. To develop stable and meaningful relationships with all family members. 2. To develop stable peer group relationships. 3. To avoid undesirable relationships.	1. Improve hygiene and health standards.

MULTIMODAL PROFILE.

Child: Date:

D/B: C.A.: School: Page:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Personnel Involved.	Case worker Social Worker Teacher	Case worker (psychologist).	Case Worker - medical agencies	Case worker Social Worker Psychologist.	Teacher Case Worker Play Group Teacher	Case Worker Social Worker	Case Worker
Evaluation	1 & 4. frequency of outbursts. 2. frequency of running 3. frequency of involvement with undesirable man. 5. time spent "on task" in class. 6. Physical state of her fingers.	Extent to which she can talk out her feelings. Projective inventories scores. Observed emotional maturity level.	Number of psychosomatic incidents.	frequency of positive self statements. Observation of her degree of committment to pre-school group.	Time spent "on task" in class.	Subjective view of relationships with relevant people. Rep Grid analysis of family.	General health examination.
Review.	On-going - weekly formal - 3 monthly	On-going - weekly formal -3 monthly	3 monthly	On-going -weekly formal -3 monthly	On-going - daily formal -3 monthly	On-going -weekly formal -3 monthly	On-going - weekly formal - 3 month

MULTIMODAL ASSESSMENT OF CHILD IN SPECIAL

EDUCATION - MODERATE / SEVERE LEARNING DIFFICULTIES.

Department of Education
Ayr Division

Child Guidance Centre
2 Donaldson Avenue
Saltcoats
Tel Saltcoats 63495

Strathclyde Regional Council

MULTIMODAL PROFILE.

Child's Name: .....

Address: .....

D/B: ..... Chronological Age: .....

School: ..... Class: .....

Teacher: ..... Psychologist: .....

Date: .....

Suggested Review: .....

The multimodal profile of a child considers a framework on which a child's whole functioning can be considered. The seven areas or modalities are not meant to be mutually exclusive, and independent areas of functioning, and inevitably some overlap will be apparent. Six of the modalities (Behaviour, Affect, Sensation, Imagery, Cognitive Processes, Interpersonal Relationships) are psychological constructs built on the seventh modality, (Health) which represents the child's physiological/ biological base.

This method of describing a child's functioning gives a valid framework on which to consider intervention/remediation strategies.

T. E. Williams, Senior Psychologist.

MULTIMODAL PROFILE.

The Multimodal Report considers the child's psychological functioning across the seven major modalities. The layout of the report follows in a logical and sequential fashion as follows:

PROBLEM DEFINED → **PATTERN OF PROBLEM** → **CONSEQUENCES**

(detailed description of main problem areas across seven modalities).

(How and in what situations the problems occur).

(what is the consequence for child and others of the problem as outlined).

→ **INTERVENTION STRATEGIES** → **INTERVENTION RECOMMENDATIONS**

(across the seven modalities are there interventions that are psychologically appropriate).

(A generalised recommendation which takes into account all aspects of the child's functioning).

MULTIMODAL PROFILE

Date:

Child:

Page:

D/B: _____ C.A.: _____ School:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Areas of Concern.	(1) Immature Behaviour. (2) Clumsy Behaviour - see 'sensation' (3) Hand/finger biting.	Emotionally immature - but secure emotionally (as far as can be ascertained).	(1) Gross Motor skills poor. (2) Fine Motor skills very poor	(1) Superficially highly confident image of himself. - could lead him into difficulty where this is not understood.	(1) Limited intellectual potential: (a) WISC - R Verbal I.Q. = 52 Perf. I.Q. = 45 F.S. I.Q. = 44. (b) Attainments in basic skills very limited: R.A. 7½yrs Comprehension poor - 6½yrs approx. Mechanical processes achieved to a limited extent, without any depth of understanding.	(1) Socially inappropriate responses. (2) Does not get on well with peers.	Nothing noted
Pattern of Problem.	At all times.	At all times.	At all times.	When talking about himself to others - adults/peers.	In all formal learning situations.	In most social situations.	
Consequences.	Rejection by peers. Family may be over protective.	Encourages "babying" and over protection.	Any tasks involving manipulative skills very	May produce a situation where he is socially isolated.	Very limited opportunities regarding tasks that he will be able to carry out.	As before (see behaviour and imagery).	

MULTIMODAL PROFILE

Date:

Child:

Page:

D/B: _____ C.A.: _____ School:

	BEHAVIOUR	AFFECT	SENSATION	IMAGERY	COGNITION	INTERPERSONAL RELATIONSHIPS	BIOLOGICAL
Future Needs.	(1) Increase maturity of his behaviour. (2) Improve gross motor skills - if possible. (3) Reduce frequency of hand-biting.	(1) Increase his emotional self reliance in a protected environment.	(1) Improve gross motor skills. (2) Improve Fine motor skills - if possible.	(1) Help him to develop a more realistic 'public' image of himself.	Continue to encourage his development in all aspects of basic numeracy, literacy skills and social self help skills within the parameters of his abilities.	To become more socially integrated with his peers.	
Possible Plan of Actions.	(1) Social Skills Training. (2) Uncertain as to whether this is possible. (3) Behavioural programme.	Appropriate social skills training.	Uncertain as to whether this will be possible	Behavioural programme appropriate social skills.	Developing his skills in an appropriate protected work shop environment.	Appropriate social skills training.	
Review.	ANY PLACEMENT AND INTERVENTION PROGRAMME WILL HAVE TO BE REVIEWED REGULARLY.						

APPENDIX 5.

SUMMARY OF INITIAL ASSESSMENT DATA ON THE SUBJECTS AT THE POINT AT WHICH THEY ENTERED INTO THE RESEARCH PROGRAMME.

Summary of Initial Assessment Data on Subjects entering into Research Exercise.

Subject 1.

(a) Biographical Details.

Sex: Male

Chronological Age (at Assessment): 8yrs 9mths.

(b) General Intelligence

WISC: V.I.Q. = 107
P.I.Q. = 124
F.S.I.Q. = 116

(c) Attainment Testing.

1. Burt Word Reading Test: 6yrs 5mths.

2. Neale Analysis: Accuracy = 7yrs 1mth.
Comprehension = 7yrs 2mths.

3. Slingerland Test:

(a) Laterality problems.
(b) Visual Memory poor.
(c) Visual Discrimination poor.
(d) Visual Sequencing poor.
(e) Auditory Channel good.

Subject 2.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 9yrs 1mth.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 96.

(c) Attainment Testing.

1. Burt Word Reading Test: 6yrs 4mths

2. Neale Analysis: Accuracy = 6yrs 5mths
Comprehension = 6yrs 8mths.

3. Slingerland Test:

(a) Poor Visual Memory
(b) Visual discrimination poor.
(c) Auditory discrimination poor.
(d) Blending skills poor.

Subject 3.

(a) Biographical Details.

Sex: Female.

Chronological Age (at Assessment): 7yrs 3mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 93

(c) Attainment Testing.

1. Burt Word Reading Test: 12 words.

2. Slingerland Test.

(a) Visual Matching poor.
(b) Short Term Memory poor.
(c) Visual Sequencing poor.

Subject 4.

(a) Biographical Details.

Sex: Male

Chronological Age (at Assessment): 11yrs 8mths

(b) General Intelligence.

WISC:	V.I.Q.	= 106
	P.I.Q.	= 121
	F.S.I.Q.	= 113

(c) Attainment Testing.

1. Burt Word Reading Test: 8yrs 3mths

2. Neale Analysis: Accuracy: 8yrs 6mths
Comprehension: 9yrs 1mth

3. Slingerland Test:

(a) Visual Matching poor.

(b) Auditory discrimination poor.

Subject 5.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 7yrs 4mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 92.

(c) Attainment Testing.

1, Burt Word Reading Test: 0 words read.

2. Phonic Skills Test:

(a) Letter sounds very poor.
(b) Two letter blending skills very poor.

Subject 6.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 7yrs 4mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 113.

(c) Attainment Testing.

1. Neale Analysis: Accuracy = 6yrs 7mths.
Comprehension = 6yrs 9mths.

2. Slingerland Test:

(a) Visual discrimination poor.
(b) Auditory Sequential Memory poor.
(c) Motor Co-ordination poor.

Subject 7.

(a) Biographical Details.

Sex: Male

Chronological Age (at Assessment): 8yrs 1mth.

(b) General Intelligence.

1. Stanford Binet Intelligence Scale: I.Q. = 85 (lack of cooperation).

2. WISC: V.I.Q. = 101
P.I.Q. = 115
F.S.I.Q. = 107

(c) Attainment Testing.

1. Burt Word Reading Test: 5yrs 2mths.

2. Neale Analysis: Accuracy; 6yrs

3. Bender Gestalt Test of Visuo-Motor Perception: 1 standard deviation below mean.

Subject 8.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment); 8yrs 6mths.

(b) General Intelligence.

WISC: V.I.Q. = 100
P.I.Q. = 98
F.S.I.Q. = 98

(c) Attainment Testing.

1. Burt Word Reading Test : 5yrs 1mth.

2. Neale Analysis : Accuracy = 6yrs 8mths
Comprehension = 7yrs 1mth.

3. Bender Gestalt Test of Visuo-Motor Perception: 7yrs 6mths equivalent.

4. Daniels & Diack Spelling : 6yrs 4mths.

Subject 9.

(a) Biographical Details.

Sex: Male

Chronological Age (at Assessment): 8yrs 4mths

(b) General Intelligence.

WISC-R: V.I.Q. = 95
P.I.Q. = 104
F.S.I.Q. = 99

(c) Attainment Testing.

1. Burt Word Reading Test: 5yrs 11mths

2. Neale Analysis: Accuracy = 6yrs 11mths
Comprehension = 6yrs 8mths

3. Daniels & Diack Spelling: = 5yrs 11mths.

4. Aston Index:

(a) Rotation noted.
(b) Auditory perception poor.
(c) Auditory discrimination poor.

Subject 10.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 10yrs 4mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 109.

(c) Attainment Testing.

1. Burt Word Reading Test: 6yrs 10mths

2. Neale Analysis: Accuracy = 7yrs 2mths
Comprehension = 7yrs 10mths

3. Daniels & Diack Spelling: = 6yrs 9mths.

Subject 11.

(a) Biographical Details.

Sex: Female.

Chronological Age (at Assessment): 9yrs 3mths.

(b) General Intelligence.

WISC: V.I.Q. = 110
P.I.Q. = 109
F.S.I.Q. = 109

(c) Attainment Testing.

1. Burt Word Reading Test: 7yrs 1mth

2. Neale Analysis: Accuracy = 7yrs 8mths
Comprehension = 7yrs 9mths.

3. Daniels & Diack Spelling = 7yrs

Subject 12.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 7yrs 5mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 93.

(c) Attainment Testing.

1. Burt Word Reading Test: 14 words only.

2. Neale Analysis: Accuracy = 6yrs
Comprehension = 6yrs 3mths.

3. Daniels & Diack Spelling = 5yrs 2mths.

Subject 13.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 11yrs.

(b) General Intelligence.

WISC: V.I.Q. = 114
P.I.Q. = 112
F.S.I.Q. = 112

(c) Attainment Testing.

1. Burt Word Reading Test: 7yrs 6mths.

2. Neale Analysis: Accuracy = 7yrs 6mths.
Comprehension = 7yrs 10mths.

3. Schonell Spelling Test: = 7yrs 5mths.

Subject 14.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 11yrs 11mths.

(b) General Intelligence.

WISC: V.I.Q. = 98
P.I.Q. = 99
F.S.I.Q. = 98

(c) Attainment Testing.

1. Burt Word Reading Test: 7yrs 9mths.

2. Neale Analysis: Accuracy = 7yrs 6mths.
Comprehension = 8yrs 2mths.

3. Daniels & Diack Spelling: = 7yrs 6mths.

Subject 15.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 7yrs 3mths.

(b) General Intelligence.

Stanford Binet Intelligence Scale: I.Q. = 112

(c) Attainment Testing.

1. Burt Word Reading Test: 4 words only read.

2. Neale Analysis: Accuracy: 6yrs

3. Basic Numeracy: 6 - 7year level.

4. Phonic Skills.

(a) Confusion between sounding and naming single letters.
(b) Minimal phonic blending.

5. Daniels & Diack Spelling: 0 words achieved.

Subject 16.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 10yrs 2mths.

(b) General Intelligence.

WISC-R: V.I.Q. = 102
P.I.Q. = 111
F.S.I.Q. = 106

(c) Attainment Testing.

1. Burt Word Reading Test: 7yrs 8mths.

2. Neale Analysis: Accuracy: 8yrs 9mths.
Comprehension: 9yrs 3mths.

3. Aston Index:

(a) Auditory Perception poor.
(b) Auditory Discrimination poor.

4. Bender Gestalt Test of Visuo-Motor Development: more than 1 standard deviation below norms.

Subject 17.

(a) Biographical Details.

Sex: Female.

Chronological Age (at Assessment): 8yrs 3mths.

(b) General Intelligence.

WISC-R: V.I.Q. = 96
P.I.Q. = 112
F.S.I.Q. = 103

(c) Attainment Testing.

1. Burt Word Reading Test: 6yrs 4mths.

2. Neale Analysis: Accuracy: 7yrs
Comprehension: 7yrs 2mths.

3. Daniels & Diack Spelling: 6yrs 8mths.

Subject 18.

(a) Biographical Details.

Sex: Male.

Chronological Age (at Assessment): 9yrs 2mths.

(b) General Intelligence.

WISC: V.I.Q. = 97
P.I.Q. = 100
F.S.I.Q. = 98

(c) Attainment Testing.

1. Burt Word Reading Test: 7yrs.

2. Neale Analysis: Accuracy: = 7yrs 3mths.
Comprehension: = 7yrs 6mths.

3. Basic Number Attainments = 7 year level.

4. Daniels & Diack Spelling: = 7yrs 4mths.

APPENDIX 6.

RAW DATA : UNSCALED WEIGHTINGS & PROBABILITIES.

RAW DATA

The data presented on the following pages represented the original unscaled weightings and the prior and posterior probabilities, from which the final data used in the study was derived. As this raw data is presented for reference purposes only, much of it appears in the form that was produced by the computer programme used in this study.

Consequently, for technical computing reasons, there are various repetitions, redundancies and shorthand terms used which do not directly correspond with labels that appear elsewhere in the body of the thesis. Where necessary these are explained in the relevant place with reference to the data presented in the body of the thesis.

UNSCALED WEIGHTINGS

PSYCHOLOGISTS

(a) WEIGHTINGS

OBJECTIVE	PSYCHOLOGIST (P)							
	P1	P2	P3	P4	P5	P6	P7	P8
1	27	360	72	22	30	10	45	10
2	100	720	72	50	20	90	90	20
3	10	180	15	23	15	10	90	10
4	40	20	15	55	150	15	10	30
5	130	10	36	30	12	15	30	20
6	80	20	30	10	75	45	30	54
7	20	60	72	20	125	180	180	54
8	40	90	30	15	50	90	90	54
9	20	10	30	15	40	15	90	45
10	100	360	10	50	10	30	20	20

UNSCALED WEIGHTINGS

TEACHERS

(a) WEIGHTINGS

OBJECTIVE	TEACHERS (T)						
	T1	T2	T3	T4	T5	T6	T7
1	15	25	189	186	40	15	10
2	35	60	84	80	225	25	60
3	10	20	126	124	50	15	30
4	10	10	10	10	10	12	45
5	20	25	126	96	100	20	10
6	70	20	21	18	225	70	90
7	70	90	18	27	225	70	90
8	30	30	42	40	150	35	15
9	25	15	42	40	50	30	15
10	15	12	12	12	20	10	45

UNSCALED WEIGHTINGS

STUDENT TEACHERS

(a) WEIGHTINGS

OBJECTIVE	STUDENT TEACHERS (S)							
	S1	S2	S3	S4	S5	S6	S7	S8
1	40	45	20	45	315	45	45	60
2	180	67	30	100	105	15	16	90
3	120	67	90	67	315	45	90	60
4	10	30	10	45	10	30	30	10
5	180	15	180	100	315	45	45	30
6	40	203	90	20	210	60	120	20
7	360	135	180	150	315	60	60	20
8	60	67	45	30	60	10	25	40
9	20	10	45	10	30	30	20	40
10	20	45	20	10	70	10	10	30

PRIOR PROBABILITIES

The Objectives level down the left hand side refers to the Objectives as set out in the body of the thesis. An objective number without a letter (A - D) following it is taken to represent the Global probability for that objective.

PRIOR PROBABILITIES

PSYCHOLOGISTS.

STRATEGY 1 - SCM

OBJECTIVES

		P1	P2	P3	P4	P5	P6	P7	P8
GLOBAL	01	0.50	0.60	0.60	0.60	0.70	0.55	0.50	0.40
	02	0.55	0.60	0.70	0.70	0.70	0.70	0.70	0.75
	03	0.50	0.50	0.50	0.60	0.70	0.50	0.60	0.60
	4D	0.60	0.65	0.55	0.50	0.50	0.50	0.30	0.50
	05	0.70	0.65	0.50	0.60	0.60	0.65	0.60	0.55
	04	0.60	0.70	0.75	0.60	0.70	0.40	0.30	0.50
	06	0.70	0.60	0.65	0.75	0.50	0.70	0.60	0.80
	07	0.55	0.60	0.70	0.50	0.50	0.60	0.50	0.65
	08	0.70	0.60	0.60	0.65	0.70	0.50	0.30	0.35
	09	0.70	0.60	0.70	0.65	0.70	0.70	0.60	0.70
	10	0.70	0.75	0.60	0.70	0.50	0.60	0.50	0.55
REFINED	01	0.50	0.60	0.60	0.60	0.70	0.55	0.50	0.40
	02	0.55	0.60	0.70	0.70	0.70	0.70	0.70	0.75
	03	0.50	0.50	0.50	0.60	0.70	0.50	0.60	0.60
	4D	0.60	0.65	0.55	0.50	0.50	0.50	0.30	0.50
	5A	0.60	0.65	0.70	0.60	0.80	0.80	0.90	0.85
	5B	0.50	0.50	0.70	0.60	0.70	0.55	0.50	0.55
	5C	0.30	0.30	0.40	0.20	0.40	0.55	0.50	0.45
	4A	0.60	0.70	0.55	0.60	0.40	0.50	0.30	0.65
	4B	0.60	0.70	0.55	0.60	0.50	0.40	0.30	0.55
	4C	0.60	0.70	0.55	0.60	0.40	0.30	0.20	0.55
	6A	0.70	0.60	0.65	0.75	0.50	0.60	0.60	0.80
	6B	0.70	0.60	0.70	0.75	0.50	0.65	0.60	0.80
	7A	0.55	0.60	0.70	0.70	0.50	0.60	0.60	0.75
	7B	0.55	0.60	0.70	0.60	0.50	0.40	0.40	0.80
	7C	0.55	0.60	0.70	0.60	0.50	0.50	0.40	0.70
	08	0.70	0.60	0.60	0.65	0.70	0.50	0.30	0.35
	09	0.70	0.60	0.70	0.65	0.70	0.70	0.60	0.70
	10	0.70	0.75	0.60	0.70	0.50	0.60	0.50	0.55

PRIOR PROBABILITIES

TEACHER S

STRATEGY 1 - SCM

OBJECTIVES		T1	T2	T3	T4	T5	T6	T7
GLOBAL	1.	0.60	0.80	0.50	0.55	0.50	0.50	0.50
	2.	0.80	0.80	0.40	0.70	0.80	0.60	0.60
	3.	0.40	0.60	0.40	0.50	0.55	0.40	0.60
	4D.	0.60	0.80	0.20	0.50	0.50	0.50	0.70
	5.	0.60	0.70	0.60	0.70	0.60	0.65	0.60
	4.	0.60	0.50	0.20	0.30	0.40	0.50	0.70
	6.	0.80	0.90	0.60	0.60	0.80	0.70	0.80
	7.	0.80	0.60	0.70	0.65	0.60	0.75	0.60
	8.	0.40	0.60	0.60	0.70	0.70	0.45	0.70
	9.	0.80	0.70	0.60	0.80	0.50	0.80	0.80
	10.	0.70	0.70	0.30	0.80	0.60	0.70	0.80
REFINED	1.	0.60	0.80	0.50	0.55	0.50	0.50	0.50
	2.	0.80	0.80	0.40	0.70	0.80	0.60	0.60
	3.	0.40	0.60	0.40	0.50	0.55	0.40	0.60
	4D.	0.60	0.80	0.20	0.50	0.50	0.50	0.70
	5A	0.80	0.70	0.60	0.60	0.60	0.75	0.80
	5B	0.60	0.60	0.60	0.65	0.60	0.60	0.60
	5C	0.40	0.40	0.30	0.40	0.50	0.50	0.50
	4A	0.60	0.70	0.20	0.40	0.55	0.45	0.70
	4B	0.60	0.70	0.40	0.40	0.50	0.50	0.70
	4C	0.80	0.70	0.20	0.40	0.55	0.70	0.60
	6A	0.80	0.90	0.70	0.60	0.75	0.70	0.80
	6B	0.80	0.80	0.70	0.65	0.80	0.70	0.80
	7A.	0.70	0.60	0.50	0.60	0.55	0.70	0.60
	7B.	0.80	0.60	0.50	0.70	0.55	0.80	0.60
	7C.	0.90	0.60	0.30	0.80	0.70	0.80	0.70
	8.	0.40	0.60	0.60	0.70	0.70	0.45	0.70
	9.	0.80	0.70	0.60	0.80	0.50	0.80	0.80
	10.	0.70	0.70	0.30	0.80	0.60	0.70	0.80

PRIOR PROBABILITIES

STUDENT TEACHER S

STRATEGY 1 - SCM

OBJECTIVES

		S1	S2	S3	S4	S5	S6	S7	S8
GLOBAL	1.	0.70	0.20	0.60	0.50	0.90	0.20	0.40	0.60
	2.	0.80	0.60	0.60	0.80	0.85	0.80	0.60	0.70
	3.	0.80	0.40	0.65	0.75	0.70	0.30	0.70	0.60
	4D.	0.70	0.50	0.85	0.70	0.50	0.70	0.60	0.50
	5.	0.80	0.40	0.80	0.50	0.90	0.40	0.60	0.50
	4.	0.75	0.40	0.55	0.40	0.40	0.30	0.70	0.60
	6.	0.75	0.60	0.80	0.40	0.90	0.95	0.80	0.55
	7.	0.80	0.55	0.60	0.65	0.90	0.90	0.80	0.55
	8.	0.80	0.55	0.70	0.50	0.70	0.50	0.80	0.60
	9.	0.75	0.55	0.75	0.60	0.95	0.30	0.80	0.60
	10.	0.70	0.70	0.55	0.60	0.70	0.30	0.80	0.60
REFINES	1.	0.70	0.20	0.60	0.50	0.90	0.20	0.40	0.60
	2.	0.80	0.60	0.60	0.80	0.85	0.80	0.60	0.70
	3.	0.80	0.40	0.65	0.75	0.70	0.30	0.70	0.60
	4D.	0.70	0.50	0.85	0.70	0.50	0.70	0.60	0.50
	5A.	0.80	0.40	0.80	0.70	0.90	0.30	0.80	0.70
	5B.	0.80	0.40	0.55	0.55	0.70	0.30	0.70	0.50
	5B.	0.75	0.40	0.65	0.25	0.70	0.10	0.70	0.50
	4A.	0.85	0.50	0.75	0.30	0.70	0.40	0.90	0.30
	4B.	0.75	0.40	0.80	0.80	0.60	0.60	0.70	0.40
	4C.	0.80	0.50	0.85	0.60	0.60	0.30	0.60	0.50
	6A.	0.85	0.70	0.80	0.70	0.90	0.60	0.80	0.60
	6B.	0.85	0.70	0.80	0.65	0.90	0.90	0.80	0.60
	7A.	0.80	0.50	0.85	0.70	0.60	0.70	0.80	0.50
	7B.	0.85	0.60	0.75	0.50	0.90	0.70	0.70	0.55
	7C.	0.80	0.55	0.70	0.70	0.95	0.70	0.70	0.55
	8.	0.80	0.55	0.70	0.50	0.70	0.50	0.80	0.60
	9.	0.75	0.55	0.75	0.60	0.95	0.30	0.80	0.60
	10.	0.70	0.70	0.55	0.60	0.70	0.30	0.80	0.60

PRIOR PROBABILITIES

PSYCHOLOGIST S

STRATEGY 2 - UDM

OBJECTIVES

		P1	P2	P3	P4	P5	P6	P7	P8
GLOBAL	01	0.40	0.45	0.20	0.40	0.20	0.30	0.30	0.50
	02	0.30	0.20	0.15	0.30	0.20	0.30	0.80	0.40
	03	0.40	0.20	0.40	0.50	0.30	0.40	0.40	0.40
	4D	0.50	0.45	0.65	0.60	0.20	0.50	0.50	0.60
	05	0.30	0.45	0.35	0.30	0.20	0.50	0.80	0.30
	04	0.50	0.40	0.65	0.50	0.20	0.50	0.50	0.80
	06	0.40	0.40	0.50	0.50	0.30	0.50	0.50	0.50
	07	0.30	0.40	0.50	0.40	0.30	0.30	0.60	0.50
	08	0.60	0.40	0.45	0.50	0.20	0.20	0.50	0.40
	09	0.60	0.20	0.45	0.50	0.30	0.30	0.40	0.20
	10	0.20	0.30	0.40	0.30	0.25	0.40	0.40	0.40
REFINED	01	0.40	0.45	0.20	0.40	0.20	0.30	0.30	0.50
	02	0.30	0.20	0.15	0.30	0.20	0.30	0.80	0.40
	03	0.40	0.20	0.40	0.50	0.30	0.40	0.40	0.40
	4D	0.50	0.45	0.65	0.60	0.20	0.50	0.50	0.60
	5A	0.60	0.50	0.60	0.30	0.60	0.80	0.75	0.70
	5B	0.30	0.20	0.25	0.10	0.20	0.30	0.50	0.30
	5C	0.30	0.20	0.25	0.10	0.20	0.30	0.35	0.30
	4A	0.50	0.40	0.60	0.70	0.20	0.50	0.50	0.70
	4B	0.50	0.40	0.60	0.70	0.30	0.50	0.50	0.70
	4C	0.50	0.40	0.60	0.50	0.40	0.30	0.50	0.70
	6A	0.40	0.40	0.50	0.50	0.40	0.50	0.50	0.60
	6B	0.40	0.40	0.40	0.50	0.40	0.50	0.50	0.40
	7A	0.30	0.30	0.50	0.30	0.20	0.30	0.60	0.40
	7B	0.30	0.30	0.50	0.30	0.20	0.30	0.60	0.40
	7C	0.30	0.30	0.50	0.40	0.20	0.30	0.60	0.40
	08	0.60	0.40	0.45	0.50	0.20	0.20	0.50	0.40
	09	0.60	0.20	0.45	0.50	0.30	0.30	0.40	0.20
	10	0.20	0.30	0.40	0.30	0.25	0.40	0.40	0.40

PRIOR PROBABILITIES

TEACHER S

STRATEGY 2 - UDM

OBJECTIVES

		T1	T2	T3	T4	T5	T6	T7
GLOBAL	1.	0.40	0.40	0.20	0.25	0.60	0.40	0.70
	2.	0.90	0.30	0.20	0.35	0.70	0.80	0.40
	3.	0.30	0.40	0.30	0.20	0.60	0.30	0.30
	4D.	0.50	0.30	0.40	0.60	0.60	0.60	0.40
	5.	0.50	0.40	0.30	0.30	0.55	0.50	0.40
	4.	0.50	0.30	0.60	0.65	0.50	0.60	0.60
	6.	0.60	0.70	0.50	0.30	0.50	0.60	0.70
	7.	0.60	0.30	0.50	0.50	0.65	0.60	0.50
	8.	0.50	0.50	0.20	0.50	0.60	0.50	0.70
	9.	0.40	0.30	0.40	0.35	0.55	0.50	0.50
	10.	0.60	0.40	0.20	0.60	0.55	0.70	0.50
REFINED	1.	0.40	0.40	0.20	0.25	0.60	0.40	0.70
	2.	0.90	0.30	0.20	0.35	0.70	0.80	0.40
	3.	0.30	0.40	0.30	0.20	0.60	0.30	0.30
	4D.	0.50	0.30	0.40	0.60	0.60	0.60	0.40
	5A.	0.80	0.50	0.40	0.50	0.70	0.75	0.60
	5B.	0.50	0.30	0.30	0.30	0.70	0.50	0.30
	5C.	0.40	0.30	0.10	0.15	0.55	0.50	0.30
	4A.	0.40	0.30	0.40	0.50	0.60	0.50	0.50
	4B.	0.50	0.30	0.20	0.45	0.60	0.60	0.50
	4C.	0.80	0.30	0.40	0.50	0.60	0.70	0.50
	6A.	0.60	0.70	0.60	0.45	0.55	0.60	0.70
	6B.	0.60	0.60	0.50	0.50	0.50	0.60	0.70
	7A.	0.60	0.30	0.20	0.30	0.55	0.60	0.50
	7B.	0.50	0.30	0.30	0.50	0.60	0.50	0.50
	7C.	0.60	0.30	0.50	0.50	0.65	0.60	0.50
	8.	0.50	0.50	0.20	0.50	0.60	0.50	0.70
	9.	0.40	0.30	0.40	0.35	0.55	0.50	0.50
	10.	0.60	0.40	0.20	0.60	0.55	0.70	0.50

PRIOR PROBABILITIES

STUDENT TEACHER S

STRATEGY 2 - UDM

OBJECTIVES		S1	S2	S3	S4	S5	S6	S7	S8
GLOBAL	1.	0.60	0.30	0.35	0.45	0.70	0.40	0.50	0.40
	2.	0.75	0.50	0.80	0.10	0.90	0.20	0.70	0.50
	3.	0.85	0.45	0.75	0.50	0.80	0.20	0.60	0.30
	4D.	0.80	0.55	0.70	0.40	0.80	0.80	0.50	0.55
	5.	0.85	0.55	0.65	0.60	0.80	0.60	0.50	0.40
	4.	0.80	0.30	0.65	0.60	0.70	0.60	0.60	0.60
	6.	0.85	0.50	0.70	0.65	0.85	0.60	0.60	0.50
	7.	0.85	0.60	0.70	0.70	0.80	0.50	0.60	0.45
	8.	0.75	0.65	0.60	0.70	0.80	0.70	0.70	0.50
	9.	0.80	0.70	0.55	0.40	0.90	0.40	0.60	0.40
	10.	0.75	0.65	0.60	0.50	0.80	0.50	0.60	0.50
REFINED	1.	0.60	0.30	0.35	0.45	0.70	0.40	0.50	0.40
	2.	0.75	0.50	0.80	0.10	0.90	0.20	0.70	0.50
	3.	0.85	0.45	0.75	0.50	0.80	0.20	0.60	0.30
	4D.	0.80	0.55	0.70	0.40	0.80	0.80	0.50	0.55
	5A	0.75	0.50	0.65	0.60	0.80	0.50	0.70	0.60
	5B.	0.85	0.50	0.65	0.60	0.80	0.50	0.60	0.45
	5C.	0.85	0.50	0.75	0.30	0.80	0.30	0.50	0.30
	4A.	0.80	0.40	0.65	0.50	0.90	0.50	0.70	0.55
	4B.	0.85	0.45	0.40	0.85	0.90	0.80	0.50	0.60
	4C.	0.70	0.40	0.55	0.50	0.80	0.50	0.50	0.60
	6A.	0.80	0.60	0.70	0.65	0.80	0.80	0.60	0.55
	6B.	0.80	0.65	0.60	0.55	0.80	0.60	0.60	0.55
	7A.	0.70	0.60	0.70	0.40	0.50	0.80	0.60	0.40
	7B.	0.80	0.55	0.65	0.70	0.80	0.80	0.60	0.50
	7C.	0.90	0.70	0.65	0.50	0.90	0.80	0.60	0.45
	8.	0.75	0.65	0.60	0.70	0.80	0.70	0.70	0.50
	9.	0.80	0.70	0.55	0.40	0.90	0.40	0.60	0.40
	10.	0.75	0.65	0.60	0.50	0.80	0.50	0.60	0.50

PRIOR PROBABILTIES

Psychologist s

STRATEGY 3 - M.M.

OBJECTIVES

GLOBAL	01	0.50	0.70	0.85	0.60	0.80	0.80	0.80	0.80
	02	0.60	0.70	0.70	0.75	0.80	0.80	0.30	0.75
	03	0.60	0.70	0.65	0.60	0.80	0.90	0.90	0.70
	4D	0.40	0.50	0.75	0.70	0.60	0.10	0.40	0.40
	05	0.80	0.75	0.70	0.75	0.70	0.70	0.75	0.70
	04	0.40	0.50	0.75	0.70	0.70	0.10	0.40	0.40
	06	0.60	0.60	0.60	0.60	0.60	0.30	0.50	0.80
	07	0.60	0.60	0.65	0.60	0.60	0.70	0.70	0.80
	08	0.40	0.50	0.80	0.70	0.60	0.70	0.60	0.60
	09	0.70	0.50	0.80	0.70	0.70	0.50	0.50	0.60
	10	0.80	0.80	0.65	0.80	0.60	0.20	0.50	0.80
REFINED	01	0.50	0.70	0.85	0.60	0.80	0.80	0.80	0.80
	02	0.60	0.70	0.70	0.75	0.80	0.80	0.30	0.75
	03	0.60	0.70	0.65	0.60	0.80	0.90	0.90	0.70
	4D	0.40	0.50	0.75	0.70	0.60	0.10	0.40	0.40
	5A	0.60	0.65	0.70	0.60	0.40	0.40	0.60	0.70
	5B	0.60	0.70	0.80	0.75	0.80	0.90	0.60	0.80
	5C	0.70	0.65	0.70	0.60	0.40	0.90	0.60	0.80
	4A	0.40	0.50	0.75	0.50	0.60	0.10	0.40	0.40
	4B	0.40	0.50	0.75	0.50	0.40	0.10	0.40	0.40
	4C	0.40	0.50	0.75	0.60	0.40	0.50	0.40	0.80
	6A	0.60	0.60	0.60	0.60	0.50	0.30	0.40	0.70
	6B	0.60	0.60	0.60	0.60	0.60	0.30	0.50	0.80
	7A	0.60	0.60	0.65	0.75	0.60	0.50	0.70	0.80
	7B	0.55	0.60	0.65	0.75	0.60	0.60	0.60	0.80
	7C	0.55	0.60	0.65	0.75	0.65	0.60	0.70	0.80
	08	0.40	0.50	0.80	0.70	0.60	0.70	0.60	0.60
	09	0.70	0.50	0.80	0.70	0.70	0.50	0.50	0.60
	10	0.30	0.80	0.65	0.80	0.60	0.20	0.50	0.80

PRIOR PROBABILITIES

TEACHER S

STRATEGY 3 - MM.

OBJECTIVES

		T1	T2	T3	T4	T5	T6	T7
GLOBAL	1	0.80	0.70	0.70	0.70	0.70	0.70	0.90
	2	0.80	0.70	0.60	0.60	0.40	0.60	0.80
	3	0.70	0.70	0.50	0.60	0.70	0.70	0.80
	4D	0.80	0.60	0.60	0.35	0.70	0.70	0.60
	5	0.90	0.80	0.80	0.80	0.70	0.80	0.70
	4	0.80	0.40	0.40	0.40	0.60	0.70	0.50
	6	0.60	0.80	0.20	0.40	0.25	0.60	0.60
	7	0.60	0.55	0.30	0.40	0.50	0.50	0.60
	8	0.60	0.70	0.40	0.80	0.50	0.65	0.80
	9	0.60	0.60	0.20	0.70	0.60	0.60	0.70
	10	0.70	0.70	0.40	0.40	0.50	0.55	0.70
REFINED	1	0.80	0.70	0.70	0.70	0.70	0.70	0.90
	2	0.80	0.70	0.60	0.60	0.40	0.60	0.80
	3	0.70	0.70	0.50	0.60	0.70	0.70	0.80
	4D	0.80	0.60	0.60	0.35	0.70	0.70	0.60
	5A	0.90	0.70	0.20	0.70	0.80	0.90	0.60
	5B	0.90	0.70	0.90	0.80	0.80	0.75	0.80
	5C	0.90	0.70	0.70	0.80	0.80	0.80	0.80
	4A	0.80	0.60	0.60	0.70	0.70	0.70	0.30
	4B	0.70	0.60	0.60	0.60	0.70	0.70	0.30
	4C	0.80	0.60	0.60	0.60	0.65	0.70	0.40
	6A	0.60	0.80	0.20	0.35	0.25	0.60	0.60
	6B	0.60	0.70	0.20	0.30	0.25	0.60	0.60
	7A	0.60	0.55	0.40	0.50	0.60	0.50	0.70
	7B	0.60	0.55	0.10	0.40	0.50	0.60	0.70
	7C	0.60	0.55	0.10	0.65	0.50	0.60	0.60
	8	0.60	0.70	0.40	0.80	0.50	0.65	0.80
	9	0.60	0.60	0.20	0.70	0.60	0.60	0.70
	10	0.70	0.70	0.40	0.40	0.50	0.55	0.70

PRIOR PROBABILITIES

STUDENT TEACHER S

STRATEGY 3 - MM

OBJECTIVES

		S1	S2	S3	S4	S5	S6	S7	S8
GLOBAL	1	0.80	0.50	0.75	0.60	0.80	0.70	0.70	0.85
	2	0.85	0.70	0.70	0.75	0.80	0.50	0.50	0.60
	3	0.90	0.55	0.80	0.90	0.90	0.60	0.90	0.70
	4 D	0.85	0.60	0.50	0.55	0.70	0.50	0.70	0.40
	5	0.90	0.60	0.60	0.80	0.70	0.60	0.90	0.70
	4	0.65	0.25	0.75	0.50	0.90	0.40	0.50	0.30
	6	0.90	0.45	0.65	0.50	0.80	0.25	0.40	0.55
	7	0.90	0.65	0.80	0.55	0.70	0.25	0.50	0.70
	8	0.85	0.70	0.80	0.60	0.90	0.40	0.60	0.70
	9	0.90	0.60	0.60	0.50	0.80	0.50	0.70	0.75
	10	0.80	0.80	0.75	0.70	0.95	0.80	0.70	0.75
REFINED	1	0.80	0.50	0.75	0.60	0.80	0.70	0.70	0.85
	2	0.85	0.70	0.70	0.75	0.80	0.50	0.50	0.60
	3	0.90	0.55	0.80	0.90	0.90	0.60	0.90	0.70
	4D	0.85	0.60	0.50	0.55	0.70	0.50	0.70	0.40
	5A	0.90	0.60	0.55	0.50	0.70	0.80	0.60	0.65
	5B	0.90	0.60	0.75	0.70	0.90	0.80	0.80	0.70
	5C	0.90	0.60	0.55	0.70	0.95	0.90	0.90	0.70
	4A	0.70	0.45	0.45	0.25	0.85	0.80	0.60	0.40
	4B	0.70	0.50	0.60	0.50	0.75	0.40	0.60	0.50
	4C	0.75	0.60	0.75	0.30	0.70	0.80	0.70	0.45
	6A	0.90	0.50	0.60	0.60	0.70	0.20	0.40	0.65
	6B	0.90	0.55	0.40	0.45	0.70	0.20	0.40	0.65
	7A	0.85	0.55	0.50	0.50	0.40	0.20	0.50	0.55
	7B	0.90	0.70	0.55	0.60	0.70	0.20	0.50	0.60
	7C	0.85	0.60	0.60	0.60	0.80	0.20	0.50	0.60
	8	0.85	0.70	0.80	0.60	0.90	0.40	0.60	0.70
	9	0.90	0.60	0.60	0.50	0.80	0.50	0.70	0.75
	10	0.80	0.80	0.75	0.70	0.95	0.80	0.70	0.75

POSTERIOR PROBABILITIES - ASSESSMENT

S1 - S6 : subjects from Strategy 1 - SCM

S7 - S12: subjects from Strategy 2 - UDM

S13 -S18: subjects from Strategy 3 - MM

POSTERIOR PROBABILITIES - INTERVENTION

S1 - S5: subjects from Strategy 1 - SCM

S6 - S10: subjects from Strategy 2 - UDM

S11 - S14:subjects from Strategy 3 - MM

NOTE: Where 2.0 appears in the probability column this indicates a subject that was not considered by that particular expert. The 2.0 was merely a technical device made necessary by the computer programme and does not represent a probability.

POSTERIOR PROBABILITIES – ASSESSMENT

EXPERT 1

	GLOBAL					REFINED					
	1	2	3	4 (D)	5(T)	1	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.10	0.30	0.30	0.30	0.30	0.10	0.30	0.30	0.30	0.50	0.10	0.10
S 2	0.20	0.20	0.30	0.30	0.20	0.20	0.20	0.30	0.30	0.50	0.10	0.10
S 3	0.10	0.20	0.30	0.30	0.30	0.10	0.20	0.30	0.30	0.50	0.20	0.10
S 4	0.30	0.20	0.30	0.30	0.30	0.30	0.20	0.30	0.30	0.50	0.10	0.10
S 5	0.30	0.20	0.30	0.40	0.30	0.30	0.20	0.30	0.40	0.50	0.10	0.10
S 6	0.30	0.20	0.30	0.40	0.40	0.30	0.20	0.30	0.40	0.50	0.20	0.10
S 7	0.20	0.20	0.20	0.40	0.20	0.20	0.20	0.20	0.40	0.30	0.20	0.05
S 8	0.10	0.10	0.20	0.10	0.30	0.10	0.10	0.20	0.10	0.30	0.20	0.05
S 9	0.05	0.05	0.10	0.10	0.10	0.05	0.05	0.10	0.10	0.20	0.00	0.10
S10	0.60	0.75	0.60	0.70	0.50	0.60	0.75	0.60	0.70	0.70	0.30	0.20
S11	0.05	0.10	0.10	0.10	0.10	0.05	0.10	0.10	0.10	0.10	0.05	0.05
S12	0.10	0.10	0.50	0.10	0.20	0.10	0.10	0.50	0.10	0.20	0.05	0.10
S13	0.60	0.50	0.80	0.80	0.50	0.60	0.50	0.80	0.80	0.50	0.60	0.20
S14	0.50	0.50	0.20	0.70	0.50	0.50	0.50	0.20	0.70	0.40	0.55	0.15
S15	0.70	0.60	0.90	0.70	0.60	0.70	0.60	0.90	0.70	0.40	0.50	0.50
S16	0.50	0.40	0.60	0.60	0.50	0.50	0.40	0.60	0.60	0.50	0.70	0.30
S17	0.70	0.70	0.40	0.50	0.50	0.70	0.70	0.40	0.50	0.60	0.70	0.30
S18	0.70	0.60	0.50	0.60	0.50	0.70	0.60	0.50	0.60	0.30	0.60	0.50

EXPERT 2

	GLOBAL					REFINED					
	1	2	3	4(D)	5(T)	1	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.30	0.50	0.20	0.40	0.30	0.30	0.50	0.20	0.40	0.50	0.00	0.60
S 2	0.10	0.10	0.20	0.20	0.30	0.10	0.10	0.20	0.20	0.40	0.00	0.40
S 3	0.30	0.20	0.00	0.00	0.20	0.30	0.20	0.00	0.00	0.30	0.00	0.00
S 4	0.60	0.40	0.00	0.50	0.20	0.60	0.40	0.00	0.50	0.40	0.00	0.50
S 5	0.50	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20	0.30	0.00	0.00
S 6	0.40	0.20	0.00	0.30	0.20	0.40	0.20	0.00	0.30	0.30	0.00	0.40
S 7	0.80	0.50	0.50	0.70	0.30	0.80	0.50	0.50	0.70	0.60	0.40	0.00
S 8	0.30	0.00	0.50	0.20	0.10	0.30	0.00	0.50	0.20	0.10	0.10	0.10
S 9	0.10	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.10	0.00	0.00	0.00
S10	0.60	0.50	0.40	0.50	0.40	0.60	0.50	0.40	0.50	0.50	0.50	0.10
S11	0.10	0.10	0.00	0.10	0.10	0.10	0.10	0.00	0.10	0.10	0.00	0.00
S12	0.10	0.10	0.10	0.00	0.10	0.10	0.10	0.10	0.00	0.20	0.00	0.00
S13	1.00	1.00	1.00	1.00	0.80	1.00	1.00	1.00	1.00	0.80	1.00	1.00
S14	1.00	0.90	0.80	0.80	0.70	1.00	0.90	0.80	0.80	0.30	1.00	1.00
S15	1.00	0.70	1.00	0.60	0.60	1.00	0.70	1.00	0.60	0.30	1.00	1.00
S16	1.00	0.90	0.60	0.80	0.70	1.00	0.90	0.60	0.80	0.50	0.80	1.00
S17	0.90	0.90	1.00	0.90	0.60	0.90	0.90	1.00	0.90	0.30	1.00	0.90
S18	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.50	0.90	0.80

POSTERIOR PROBABILITIES
- ASSESSMENT

EXPERT 3

	GLOBAL					REFINED						
	1	2	3	4(D)	5(T)	1	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.50	0.60	0.30	0.60	0.40	0.50	0.60	0.30	0.60	0.50	0.10	0.10
S 2	0.40	0.50	0.40	0.40	0.40	0.40	0.50	0.40	0.40	0.70	0.20	0.10
S 3	0.30	0.40	0.20	0.40	0.30	0.30	0.40	0.20	0.40	0.60	0.10	0.10
S 4	0.40	0.60	0.20	0.60	0.40	0.40	0.60	0.20	0.40	0.60	0.20	0.40
S 5	0.30	0.50	0.30	0.40	0.40	0.30	0.50	0.30	0.40	0.60	0.20	0.20
S 6	0.30	0.40	0.30	0.30	0.40	0.30	0.40	0.30	0.30	0.60	0.10	0.10
S 7	0.30	0.30	0.20	0.30	0.20	0.30	0.30	0.20	0.30	0.10	0.50	0.00
S 8	0.30	0.10	0.30	0.40	0.20	0.30	0.10	0.30	0.40	0.10	0.40	0.70
S 9	0.70	0.20	0.00	0.30	0.10	0.70	0.20	0.00	0.30	0.00	0.00	0.20
S10	0.20	0.30	0.20	0.20	0.40	0.20	0.30	0.20	0.20	0.40	0.40	0.10
S11	0.40	0.20	0.30	0.20	0.00	0.40	0.20	0.30	0.20	0.00	0.00	0.00
S12	0.70	0.50	0.60	0.40	0.50	0.70	0.50	0.60	0.40	0.70	0.70	0.30
S13	0.60	0.80	0.30	0.90	0.70	0.60	0.80	0.30	0.90	0.70	0.80	0.50
S14	0.80	1.00	0.80	0.90	0.80	0.80	1.00	0.80	0.90	0.90	0.90	0.50
S15	0.70	0.90	0.80	0.90	0.80	0.70	0.90	0.80	0.90	0.90	0.90	0.60
S16	0.90	0.80	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.70
S17	0.80	0.80	0.80	0.90	0.80	0.80	0.80	0.80	0.90	0.60	0.90	0.70
S18	0.90	0.90	0.80	0.90	0.90	0.90	0.90	0.80	0.90	0.90	0.90	0.60

EXPERT 4

	GLOBAL					REFINED						
	1	2	3	4(D)	5(T)	1	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.50	0.20	0.30	0.40	0.40	0.50	0.20	0.30	0.40	0.50	0.10	0.20
S 2	0.50	0.10	0.30	0.40	0.40	0.50	0.10	0.30	0.40	0.50	0.10	0.10
S 3	0.40	0.20	0.20	0.30	0.30	0.40	0.20	0.20	0.30	0.40	0.10	0.10
S 4	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
S 5	0.50	0.30	0.30	0.40	0.20	0.50	0.30	0.30	0.40	0.40	0.10	0.10
S 6	0.40	0.10	0.40	0.40	0.30	0.40	0.10	0.40	0.40	0.50	0.20	0.20
S 7	0.80	0.50	0.20	0.40	0.60	0.80	0.50	0.20	0.40	0.60	0.40	0.00
S 8	0.70	0.20	0.10	0.10	0.30	0.70	0.20	0.10	0.10	0.20	0.40	0.00
S 9	0.80	0.20	0.00	0.10	0.30	0.80	0.20	0.00	0.10	0.30	0.00	0.20
S10	0.70	0.90	0.60	0.80	0.80	0.70	0.90	0.60	0.80	0.80	0.80	0.00
S11	0.80	0.20	0.00	0.20	0.10	0.80	0.20	0.00	0.20	0.20	0.00	0.00
S12	0.70	0.20	0.20	0.10	0.30	0.70	0.20	0.20	0.10	0.30	0.20	0.00
S13	0.80	1.00	0.90	0.80	0.80	0.80	1.00	0.90	0.80	0.80	0.90	0.80
S14	0.80	1.00	0.90	0.80	0.80	0.80	1.00	0.90	0.80	0.70	0.90	0.80
S15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.60	0.90	0.90
S16	0.80	0.90	0.80	0.80	0.80	0.80	0.90	0.80	0.80	0.60	0.90	0.90
S17	0.90	0.80	0.70	0.90	0.80	0.90	0.80	0.70	0.90	0.70	0.80	0.80
S18	0.90	1.00	0.80	0.80	0.90	0.90	1.00	0.80	0.80	0.70	0.90	0.80

POSTERIOR PROBABILTIES
- ASSESSMENT

	GLOBAL					REFINED					
EXPERT 5	1	2	3	4(D)	5(T)	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.50	0.20	0.20	0.50	0.60	0.50	0.20	0.20	0.50	0.70	0.20	0.20
S 2	0.50	0.10	0.20	0.50	0.60	0.50	0.10	0.20	0.50	0.70	0.10	0.10
S 3	0.50	0.40	0.40	0.50	0.50	0.50	0.40	0.40	0.50	0.70	0.30	0.50
S 4	0.50	0.20	0.20	0.50	0.40	0.50	0.20	0.20	0.50	0.70	0.10	0.10
S 5	0.50	0.20	0.20	0.50	0.40	0.50	0.20	0.20	0.50	0.70	0.10	0.20
S 6	0.50	0.20	0.20	0.50	0.50	0.50	0.20	0.20	0.50	0.70	0.10	0.30
S 7	0.60	0.70	0.20	0.70	0.40	0.60	0.70	0.20	0.70	0.50	0.30	0.10
S 8	0.30	0.40	0.20	0.50	0.60	0.30	0.40	0.20	0.50	0.60	0.60	0.70
S 9	0.30	0.00	0.00	0.20	0.10	0.30	0.00	0.00	0.20	0.10	0.00	0.30
S10	0.70	0.60	0.50	0.70	0.60	0.70	0.60	0.50	0.70	0.80	0.40	0.40
S11	0.30	0.40	0.20	0.20	0.30	0.30	0.40	0.20	0.20	0.30	0.10	0.40
S12	0.20	0.40	0.20	0.30	0.20	0.20	0.40	0.20	0.30	0.30	0.10	0.10
S13	0.90	0.90	0.40	0.60	0.90	0.90	0.90	0.40	0.60	0.90	0.90	0.90
S14	0.90	0.90	0.80	0.60	0.90	0.90	0.90	0.80	0.60	0.90	0.90	0.90
S15	0.90	1.00	0.90	0.70	0.70	0.90	1.00	0.90	0.70	0.70	0.90	0.80
S16	0.80	1.00	1.00	0.50	0.50	0.80	1.00	1.00	0.50	0.30	0.90	0.80
S17	0.80	0.90	0.90	0.70	0.80	0.80	0.90	0.90	0.70	0.70	0.90	0.80
S18	0.90	1.00	0.80	0.50	0.70	0.90	1.00	0.80	0.50	0.60	0.90	0.90

	GLOBAL					REFINED					
EXPERT 6	1	2	3	4(D)	5(T)	1	2	3	4(D)	5(A)	5(B)	5(C)
S 1	0.20	0.30	0.30	0.30	0.40	0.20	0.30	0.30	0.30	0.70	0.10	0.10
S 2	0.30	0.30	0.40	0.30	0.40	0.30	0.30	0.40	0.30	0.60	0.10	0.10
S 3	0.40	0.30	0.30	0.40	0.30	0.40	0.30	0.30	0.40	0.50	0.10	0.10
S 4	0.40	0.50	0.40	0.40	0.40	0.40	0.50	0.40	0.40	0.60	0.10	0.10
S 5	0.20	0.20	0.40	0.40	0.30	0.20	0.20	0.40	0.40	0.40	0.20	0.10
S 6	0.30	0.30	0.30	0.50	0.20	0.30	0.30	0.30	0.50	0.40	0.10	0.10
S 7	0.60	0.20	0.30	0.40	0.30	0.60	0.20	0.30	0.40	0.30	0.20	0.20
S 8	0.70	0.20	0.50	0.50	0.40	0.70	0.20	0.50	0.50	0.40	0.20	0.30
S 9	0.70	0.20	0.50	0.50	0.30	0.70	0.20	0.50	0.50	0.40	0.20	0.30
S10	0.60	0.50	0.60	0.60	0.40	0.60	0.50	0.60	0.60	0.50	0.30	0.40
S11	0.70	0.20	0.30	0.50	0.40	0.70	0.20	0.30	0.50	0.40	0.20	0.30
S12	0.60	0.20	0.50	0.50	0.40	0.60	0.20	0.50	0.50	0.40	0.20	0.30
S13	0.60	0.70	0.70	0.60	0.60	0.60	0.70	0.70	0.60	0.50	0.70	0.30
S14	0.60	0.70	0.70	0.60	0.50	0.60	0.70	0.70	0.60	0.50	0.70	0.30
S15	0.70	0.80	0.60	0.70	0.60	0.70	0.80	0.60	0.70	0.40	0.80	0.40
S16	0.50	0.80	0.60	0.70	0.60	0.50	0.80	0.60	0.70	0.50	0.60	0.50
S17	0.80	0.80	0.90	0.70	0.60	0.80	0.80	0.90	0.70	0.50	0.90	0.40
S18	0.70	0.70	0.60	0.70	0.60	0.70	0.70	0.60	0.70	0.40	0.80	0.50

POSTERIOR PROBABILITIES
- INTERVENTION - RUN 1

EXPERT 1	GLOBAL 4(T)	6(T)	7(T)	8	9	10	REFINED 4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.20
S 2	0.50	0.50	0.50	0.60	0.60	0.40	0.50	0.50	0.50	0.40	0.50	0.40	0.50	0.70	0.60	0.60	0.40
S 3	0.40	0.50	0.40	0.40	0.60	0.40	0.50	0.40	0.30	0.60	0.50	0.40	0.40	0.50	0.40	0.60	0.40
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	0.30	0.50	0.40	0.20	0.20	0.30	0.40	0.20	0.30	0.50	0.40	0.40	0.30	0.50	0.20	0.20	0.30
S 7	0.40	0.30	0.50	0.20	0.70	0.40	0.40	0.50	0.30	0.30	0.40	0.50	0.40	0.50	0.20	0.70	0.40
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	0.50	0.60	0.30	0.30	0.70	0.50	0.50	0.50	0.50	0.70	0.60	0.20	0.30	0.30	0.30	0.70	0.50
S12	0.40	0.30	0.40	0.50	0.70	0.50	0.50	0.50	0.30	0.30	0.30	0.40	0.40	0.30	0.50	0.70	0.50
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

EXPERT 2	GLOBAL 4(T)	6(T)	7(T)	8	9	10	REFINED 4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	0.40	0.50	0.50	0.30	0.40	0.50	0.30	0.40	0.40	0.50	0.50	0.40	0.50	0.50	0.30	0.40	0.50
S 4	0.40	0.50	0.30	0.60	0.40	0.30	0.40	0.40	0.30	0.50	0.40	0.20	0.20	0.50	0.60	0.40	0.30
S 5	0.50	0.40	0.30	0.50	0.30	0.30	0.40	0.40	0.40	0.50	0.40	0.30	0.30	0.40	0.50	0.30	0.30
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	0.30	0.30	0.30	0.00	0.60	0.20	0.40	0.20	0.20	0.40	0.30	0.30	0.30	0.50	0.00	0.60	0.20
S 9	0.60	0.60	0.40	0.60	0.60	0.40	0.60	0.60	0.60	0.70	0.50	0.40	0.40	0.60	0.60	0.60	0.40
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.40	0.50	0.30	0.70	0.70	0.80	0.40	0.40	0.20	0.50	0.50	0.10	0.20	0.40	0.70	0.70	0.80
S14	0.40	0.50	0.40	0.50	0.60	0.70	0.40	0.40	0.40	0.40	0.60	0.50	0.20	0.40	0.50	0.60	0.70

POSTERIOR PROBABILITIES

+ INTERVENTION - RUN 1

EXPERT 3	GLOBAL 4(T)	6(T)	7(T)	8	9	10	REFINED 4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.40	0.40	0.40	0.30	0.40	0.50	0.30	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.30	0.40	0.50
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	0.40	0.30	0.50	0.50	0.50	0.50	0.40	0.40	0.40	0.40	0.30	0.40	0.50	0.40	0.50	0.50	0.50
S 5	0.40	0.40	0.50	0.50	0.50	0.50	0.50	0.40	0.40	0.50	0.50	0.40	0.50	0.40	0.50	0.50	0.50
S 6	0.40	0.50	0.50	0.40	0.60	0.50	0.30	0.30	0.40	0.50	0.50	0.50	0.50	0.50	0.40	0.60	0.50
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	0.40	0.30	0.40	0.50	0.40	0.60	0.40	0.40	0.40	0.40	0.40	0.30	0.40	0.40	0.50	0.40	0.60
S11	0.60	0.50	0.30	0.70	0.70	0.80	0.50	0.60	0.50	0.50	0.50	0.40	0.30	0.40	0.70	0.70	0.80
S12	0.50	0.20	0.30	0.70	0.80	0.80	0.40	0.40	0.50	0.30	0.20	0.30	0.30	0.40	0.70	0.80	0.80
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

EXPERT 4	GLOBAL 4(T)	6(T)	7(T)	8	9	10	REFINED 4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	0.70	0.60	0.50	0.50	0.50	0.60	0.70	0.70	0.70	0.70	0.60	0.50	0.50	0.40	0.50	0.50	0.60
S 3	0.60	0.60	0.60	0.60	0.40	0.50	0.60	0.50	0.50	0.50	0.60	0.40	0.50	0.60	0.60	0.40	0.50
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	0.50	0.40	0.40	0.40	0.40	0.50	0.60	0.40	0.50	0.40	0.40	0.40	0.30	0.50	0.40	0.40	0.50
S 8	0.60	0.50	0.40	0.30	0.50	0.40	0.50	0.60	0.40	0.50	0.50	0.50	0.40	0.40	0.30	0.50	0.40
S 9	0.50	0.50	0.50	0.40	0.60	0.50	0.60	0.50	0.30	0.60	0.40	0.50	0.50	0.40	0.40	0.60	0.50
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.50	0.40	0.40	0.70	0.60	0.70	0.50	0.40	0.50	0.50	0.40	0.40	0.50	0.40	0.70	0.60	0.70
S14	0.60	0.50	0.60	0.70	0.80	0.70	0.50	0.50	0.60	0.50	0.50	0.50	0.60	0.40	0.70	0.80	0.70

POSTERIOR PROBABILITIES

- INTERVENTION - RUN 1

	GLOBAL						REFINED										
EXPERT 5	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	0.60	0.40	0.40	0.40	0.40	0.50	0.60	0.70	0.50	0.30	0.40	0.40	0.30	0.40	0.40	0.40	0.50
S 5	0.20	0.40	0.30	0.40	0.50	0.50	0.30	0.20	0.30	0.40	0.20	0.40	0.30	0.30	0.40	0.50	0.50
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	0.40	0.50	0.40	0.50	0.50	0.40	0.30	0.40	0.40	0.50	0.40	0.40	0.30	0.40	0.50	0.50	0.40
S 9	0.40	0.40	0.50	0.50	0.40	0.40	0.40	0.40	0.40	0.30	0.50	0.30	0.40	0.40	0.50	0.40	0.40
S10	0.40	0.30	0.40	0.30	0.40	0.30	0.50	0.40	0.40	0.30	0.30	0.40	0.30	0.30	0.30	0.40	0.30
S11	0.40	0.40	0.40	0.40	0.60	0.70	0.40	0.50	0.40	0.30	0.30	0.30	0.40	0.40	0.40	0.60	0.70
S12	0.50	0.40	0.30	0.60	0.70	0.60	0.40	0.40	0.50	0.40	0.40	0.30	0.50	0.50	0.60	0.70	0.60
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

	GLOBAL						REFINED										
EXPERT 6	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.30	0.20	0.30	0.40	0.40	0.30	0.30	0.20	0.30	0.20	0.30	0.20	0.30	0.40	0.40	0.40	0.30
S 2	0.40	0.30	0.40	0.50	0.40	0.50	0.30	0.40	0.30	0.30	0.30	0.50	0.40	0.30	0.50	0.40	0.50
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	0.20	0.30	0.40	0.40	0.50	0.50	0.20	0.10	0.20	0.20	0.30	0.30	0.30	0.40	0.40	0.50	0.50
S 7	0.30	0.30	0.30	0.20	0.10	0.30	0.30	0.30	0.20	0.20	0.40	0.40	0.30	0.20	0.20	0.10	0.30
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	0.30	0.20	0.20	0.40	0.30	0.40	0.40	0.30	0.20	0.20	0.20	0.40	0.30	0.20	0.40	0.30	0.40
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.30	0.40	0.40	0.50	0.60	0.50	0.30	0.30	0.20	0.30	0.30	0.40	0.30	0.30	0.50	0.60	0.50
S14	0.40	0.30	0.30	0.40	0.50	0.60	0.40	0.40	0.30	0.30	0.40	0.40	0.30	0.30	0.40	0.50	0.60

POSTERIOR PROBABILITIES

- INTERVENTION - RUN 2

	GLOBAL						REFINED										
EXPERT 1	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	0.40	0.50	0.40	0.60	0.70	0.20	0.40	0.40	0.40	0.50	0.50	0.30	0.50	0.20	0.60	0.70	0.20
S 4	0.20	0.20	0.20	0.20	0.60	0.10	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.10	0.20	0.60	0.10
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	0.75	0.70	0.70	0.40	0.75	0.60	0.75	0.75	0.75	0.70	0.70	0.70	0.80	0.70	0.40	0.75	0.60
S 8	0.60	0.50	0.20	0.40	0.40	0.30	0.80	0.80	0.50	0.80	0.40	0.20	0.20	0.20	0.40	0.40	0.30
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	0.80	0.80	0.50	0.25	0.80	0.75	0.80	0.80	0.80	0.90	0.80	0.50	0.60	0.50	0.25	0.80	0.75
S12	0.60	0.50	0.30	0.70	0.80	0.60	0.60	0.60	0.60	0.50	0.50	0.30	0.20	0.30	0.70	0.80	0.60
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

	GLOBAL						REFINED										
EXPERT 2	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.20	0.50	0.30	0.50	0.30	0.30	0.20	0.20	0.20	0.50	0.60	0.10	0.30	0.30	0.50	0.30	0.30
S 2	0.10	0.70	0.30	0.20	0.70	0.20	0.10	0.10	0.10	0.70	0.80	0.30	0.20	0.40	0.20	0.70	0.20
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	0.40	0.30	0.20	0.10	0.50	0.10	0.40	0.30	0.40	0.30	0.30	0.20	0.20	0.10	0.10	0.50	0.10
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	0.20	0.10	0.40	0.10	0.50	0.20	0.20	0.20	0.20	0.10	0.10	0.30	0.30	0.50	0.10	0.50	0.20
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.70	0.70	0.60	0.90	0.60	0.90	0.70	0.70	0.70	0.70	0.70	0.60	0.60	0.50	0.80	0.60	0.90
S14	0.60	0.60	0.50	0.80	0.60	0.70	0.60	0.70	0.60	0.60	0.60	0.40	0.50	0.50	0.80	0.60	0.70

POSTERIOR PROBABILITIES

- INTERVENTION - RUN 2

	GLOBAL						REFINED										
EXPERT 3	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.40	0.30	0.50	0.30	0.40	0.30	0.30	0.40	0.40	0.30	0.30	0.60	0.40	0.40	0.30	0.40	0.30
S 2	0.30	0.40	0.20	0.50	0.60	0.50	0.30	0.30	0.30	0.30	0.40	0.20	0.20	0.20	0.50	0.60	0.50
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	0.50	0.60	0.30	0.60	0.60	0.50	0.50	0.60	0.50	0.60	0.60	0.20	0.30	0.20	0.60	0.60	0.80
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	0.20	0.40	0.40	0.30	0.40	0.40	0.20	0.20	0.20	0.50	0.40	0.40	0.30	0.30	0.30	0.40	0.40
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.50	0.40	0.50	0.70	0.60	0.70	0.40	0.50	0.40	0.40	0.40	0.40	0.50	0.50	0.70	0.60	0.70
S14	0.60	0.50	0.60	0.80	0.60	0.70	0.50	0.60	0.60	0.40	0.50	0.30	0.50	0.60	0.80	0.60	0.70

	GLOBAL						REFINED										
EXPERT 4	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	0.40	0.30	0.30	0.40	0.60	0.30	0.30	0.40	0.50	0.20	0.50	0.30	0.20	0.30	0.40	0.60	0.30
S 4	0.30	0.50	0.60	0.10	0.70	0.30	0.30	0.30	0.40	0.50	0.50	0.70	0.60	0.50	0.10	0.70	0.30
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	0.30	0.40	0.50	0.10	0.70	0.50	0.30	0.30	0.20	0.30	0.50	0.40	0.60	0.60	0.10	0.70	0.50
S 8	0.40	0.40	0.30	0.30	0.50	0.30	0.40	0.40	0.30	0.40	0.40	0.30	0.20	0.40	0.30	0.50	0.30
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	0.50	0.40	0.20	0.50	0.30	0.50	0.50	0.50	0.60	0.40	0.40	0.10	0.20	0.30	0.50	0.30	0.50
S12	0.60	0.50	0.40	0.50	0.80	0.60	0.60	0.60	0.70	0.40	0.70	0.50	0.40	0.20	0.50	0.80	0.60
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

POSTERIOR PROBABILITIES

- INTERVENTION - RUN 2

	GLOBAL						REFINED										
EXPERT 5	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	0.50	0.60	0.70	0.60	0.30	0.30	0.40	0.50	0.60	0.60	0.60	0.80	0.70	0.70	0.60	0.30	0.30
S 2	0.40	0.40	0.40	0.60	0.50	0.60	0.40	0.50	0.40	0.40	0.50	0.50	0.40	0.40	0.60	0.50	0.60
S 3	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 4	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	0.30	0.20	0.30	0.40	0.60	0.20	0.20	0.30	0.30	0.20	0.30	0.20	0.40	0.30	0.40	0.60	0.20
S 7	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 8	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 9	0.30	0.20	0.20	0.30	0.40	0.30	0.20	0.40	0.40	0.20	0.20	0.10	0.30	0.20	0.30	0.40	0.30
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S12	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S13	0.50	0.40	0.40	0.50	0.40	0.60	0.50	0.60	0.60	0.50	0.40	0.60	0.30	0.20	0.50	0.40	0.60
S14	0.40	0.50	0.40	0.60	0.70	0.50	0.50	0.40	0.40	0.40	0.50	0.60	0.40	0.40	0.60	0.70	0.50

	GLOBAL						REFINED										
EXPERT 6	4(T)	6(T)	7(T)	8	9	10	4(A)	4(B)	4(C)	6(A)	6(B)	7(A)	7(B)	7(C)	8	9	10
S 1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 2	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 3	0.30	0.40	0.50	0.50	0.60	0.50	0.30	0.30	0.30	0.50	0.40	0.50	0.40	0.50	0.50	0.60	0.50
S 4	0.40	0.50	0.40	0.60	0.50	0.50	0.40	0.40	0.40	0.50	0.50	0.50	0.40	0.40	0.60	0.50	0.50
S 5	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 6	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S 7	0.50	0.50	0.60	0.50	0.40	0.50	0.50	0.50	0.40	0.50	0.70	0.60	0.50	0.40	0.50	0.40	0.50
S 8	0.20	0.40	0.50	0.30	0.20	0.30	0.20	0.10	0.20	0.40	0.50	0.60	0.40	0.40	0.30	0.20	0.30
S 9	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S10	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S11	0.40	0.40	0.50	0.60	0.70	0.60	0.40	0.40	0.40	0.50	0.40	0.40	0.50	0.50	0.60	0.70	0.60
S12	0.30	0.40	0.50	0.50	0.70	0.50	0.30	0.30	0.30	0.30	0.40	0.40	0.50	0.50	0.50	0.70	0.50
S13	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
S14	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

APPENDIX 7.

SAMPLE CALCULATIONS.

Final Median Utilities - Sample calculations

1. Introduction

The data presented in the body of the text represents a distillation of a large body of data which was gathered. The full raw data is given in a further appendix, but it is the intention of this short section to illustrate to the reader how this data was reduced to manageable proportions. The calaculations presented here are examples of many hundreds of calculations necessary to reduce this body of data to manageable proportions. They are presented for illustration purposes, in order to demonstrate the mechanics used in the computer programme.

2. Scaled Weightings

The raw weightings were scaled according to the formula:

$$\text{Scaled Weighting} = \frac{xi}{\Sigma xi} \times \frac{100}{1}$$

xi = Individual raw weighting

Σxi = Sum of raw weighting

For example — Psychologist 5

Raw Weighting	Scaled Weighting
* 30	5.7
20	3.8
15	2.8
50	28.5
12	2.3
75	14.2
125	23.7
50	9.5
40	7.6
10	1.9
Sum = 527	Sum = 100 (approx).

$$* \text{ Scaled Weighting} = \frac{xi}{\Sigma xi} \times \frac{100}{1}$$

$$= \frac{30}{527} \times \frac{100}{1}$$

$$= 5.7$$

NOTE: Scaled Weightings were calculated to 1 decimal place.

In the subsequent computer programme, the decimal point was dropped for convenience, thus the utilities were all increased by a constant factor of 10. As the object of the exercise was comparative, this in no way influenced the outcome and the final conclusions.

3. UTILITIES

For examplar purposes, we will consider Posterior Utilities, Assessment Phase.

3.1. Firstly, the Median value of the weighting for each objective was calculated.

e.g. For Psychologists and Objective 1 we have:

Scaled Weightings							
48	197	188	76	57	18	67	32

$$\text{Median} = \frac{57 + 67}{2} = 62$$

This was repeated for all Objectives and all judges.

3.2. These Median weightings were then combined with the relevant Posterior probabilities to give Posterior Utility Values for each expert and each strategy.

e.g. For Psychologists weightings, Expert 1, and for the subjects in Strategy 1 (S1 - S6) we have:

Utility = $\sum_{1}^{5}$WiPi

Wi = Weighting

Pi = Probability

N = (62 x 0.2) + (174 x 0.2) + (36 x 0.3) + (55 x 0.3) + (54 x 0.2)

= 12.4 + 34.8 + 10.8 + 16.5 + 10.8

= 85.3.

This gives, in this instance, the posterior utility value for Expert 1 and Subject 2.

3.3. Thus, for each subject and eaxh expert, a utility value was calculated. For each subject Median Utility Values were then calculated across the 6 experts.

e.g. For strategy 1 (S1 - S6), using the Psychologist's weightings we have:

S1 101.9
151.0
200.8
120.2
132.9
113.5

$$\text{Median} = \frac{120.2 + 132.9}{2}$$

$$= 126.6.$$

Similarly we have:

S2 - Median = 109.0

S3 - Median = 112.8

S4 - Median = 157.4

S5 - Median = 112.2

S6 - Median = 113.8

Then,a final median utility value was calculated across these 6 subjects giving a final median utility value for that strategy, thus:

126.6
109.0
112.8
157.4
112.2
113.8

$$\text{Median} = \frac{112.8 + 113.8}{2}$$

$$= 113.3$$

4. Conclusion

This cumulative method of obtaining median utility values for each strategy, which then formed the basis of inter-strategy comparison, was used throughout all the stages in the study.

APPENDIX 8.

UTILITY VALUES FOR INDIVIDUAL OBJECTIVES.

Median Utility Values for Individual Objectives

1. Introduction

Despite the fact that the thrust of the methodology was to provide information about the strategies which would facilitate decision making about the strategies as a whole, it is none the less possible to break the data down, and to provide utility values for each of the Objectives separately at each stage in the research process. For the interested reader, this data is provided, and comparative judgements about any objectives across the three strategies can be made if desired. However, as this is fundamentally contrary to the spirit of the methodology originally adopted, no discussion of such potential discriminations is offered.

2. Calculations of Median Utilities for Individual Objectives

The calculation of the median utility values for individual objectives involved considerable adaptation of the original computer programme, and the filtering down of considerable quantities of data. As with the main body of the work, the median was the preferred form of average need, in order to eliminate the influence of aberrant judge scores.
The following points are worth mentioning as far as calculation of these median utilities is concerned.

2.1. In all cases, utilities were calculated using median of the weightings attached to the various objectives by members of a group of judges - psychologists, teachers, and student teachers.

2.2 In the case of prior utilities the median weighting for all of the groups is multiplied by the prior probability assigned by each of the members of that group. The resulting eight (or, in the case of the teachers, seven) prior utilities were taken and a median value obtained for each objective.

2.3. In the case of the posterior utilities-assessment, utilities were calculated for each objective by multiplying each of the median weightings by the posterior probabilities assigned by each of the six experts to the proposition that, in the case of a particular subject, the objective would be achieved. Then medians were calculated across the six subjects representing each strategy. Finally, medians (across the six experts) of these medians were calculated.

2.4. In the case of the posterior utilities - intervention it was not possible to calculate medians across groups of subjects per expert, because the number of subjects judged by any one expert was only two or three. In this instance, the values for an objective contributed by all six experts taken together formed the basis for the calculation of the medians.

2.5. All medians have been rounded to the nearest whole number. This was considered justifiable by the probable level of reliability of the weightings and probabilities on which the utilities are based.

Such rounding of results would not materially effect any comparisons between strategies that the reader might wish to make.

3. Global and Refined Objectives

Results are presented in both Global and Refined format. The objectives referred to in the following tables of results are as follows:

3.1. Global Objectives

1. The assessment should seek information about the child from a variety of different and yet relevant sources.
2. The assessment should be such that it allows for continuous and on-going monitoring - allowing for feedback that will lead to monitored change.
3. Information should be gathered in the assessment about social and environmental factors that may influence the child's functioning.
4. The intervention and assessment should be a cost effective use of limited resources.
5. The assessment should elicit a profile of the child's strengths and weaknesses in the cognitive, affective, and physical area.
6. The intervention should seek to improve the child's attainments and mastery in reading.
7. The intervention should seek to improve the child's perception of the value of reading, their motivation to read, and then self confidence in reading.
8. The intervention should allow for the practice and consolidation of the skills taught in the remedial setting into the whole area of school life.

9. The intervention should allow for the practice and consolidation of the skills taught in the remedial setting into the home setting.

10. The intervention should be such that it allows for various intensities and degrees of intervention.

3.2. Refined Objectives

1. Same as Global

2. Same as Global

3. Same as Global

4(A) The intervention should be a cost effective and efficient use of time available.

4(B) The intervention should be a cost effective and efficient use of manpower.

4(C) The intervention should be a cost effective and efficient use of material resources.

4(D) The assessment should be a cost effective and efficient exercise.

5(A) The assessment should elicit a profile of the child's strengths and weaknesses in the cognitive area.

5(B) The assessment elicits a profile of the child's strengths and weaknesses in the affective area.

5(C) The assessment elicits a profile of the child's strengths and weaknesses in the physical area.

6(A) The intervention should seek to improve the child's attainments in reading

6(B) The intervention should seek to improve the child's mastery in reading.

7(A) The intervention should seeek to improve the child's perception of the value of reading

7(B) The intervention should seek to improve the child's motivation to read.

7(C) The intervention should seek to improve the child's self confidence in reading.

8. Same as Global

9. Same as Global

10. Same as Global

4. Utility Values Across Individual Objectives

4.1. Prior Utilities - Psychologists Median Weightings and Probabilities

Objective	Strategy - SCM	Strategy -UDM	Strategy - MM
1.	36	22	50
2.	122	52	126
3.	20	14	25
4.	33	28	25
4(A).	32	28	25
4(B).	30	28	22
4(C).	30	28	28
4(D).	28	28	25
5.	32	18	39
5(A).	40	32	32
5(B)	30	15	42
5(C)	22	15	36
6.	57	43	51
6(A)	53	43	51
6(B)	57	34	51
7.	103	72	112
7(A).	107	54	112
7(B).	103	54	107
7(C).	103	63	116
8.	52	37	52
9.	45	22	42
10.	37	22	45

TABLE A

4.2. Prior Utilities - Teacher's Median Weightings and Probabilities

Objective	Strategy - SCM	Strategy -UDM	Strategy - MM
1.	33	26	45
2.	102	58	88
3.	33	20	45
4.	17	20	17
4(A).	18	17	23
4(B).	17	17	20
4(C).	20	17	20
4(D).	17	17	20
5.	48	33	65
5(A).	57	48	57
5(B).	48	24	65
5(C).	33	24	65
6.	164	123	123
6(A).	154	123	123
6(B).	164	123	123
7.	142	110	110
7(A).	131	110	120
7(B).	131	110	120
7(C).	153	110	131
8.	59	49	64
9.	50	25	38
10.	23	18	18

Table B

4.3. Prior Utilities - Student Teacher's Median Weightings and Probabilities

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
1.	44	40	66
2.	55	40	55
3.	83	64	102
4	19	21	18
4(A)	24	19	16
4(B)	24	21	18
4(C)	21	18	24
4(D)	24	19	21
5	91	91	106
5(A)	121	91	91
5(B)	83	91	121
5(C)	76	76	121
6	99	81	68
6(A)	99	87	74
6(B)	99	74	68
7	123	113	123
7(A)	132	113	95
7(B)	132	113	113
7(C)	132	123	113
8	39	39	39
9	23	17	22
10	20	17	22

Table C

4.4. POSTERIOR UTILITIES - ASSESSMENT PHASE

4.4.1 Psychologist's Median Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
1	22	20	51
2	35	35	152
3	11	8	30
4(D)	22	12	41
5	19	13	39
5(A)	28	15	32
5(B)	5	11	49
5(C)	7	6	38

Table D

4.4.2. **Teacher's Median Weightings**

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
1	23	21	54
2	29	29	128
3	20	15	54
4(D)	13	7	25
5	28	20	59
5(A)	43	22	48
5(B)	8	25	73
5(C)	10	9	57

Table E

4.4.3. **Student Teacher's Median Weightings**

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
1	31	29	73
2	16	16	69
3	38	29	106
4(D)	14	8	26
5	53	38	109
5(A)	79	42	91
5(B)	15	30	136
5(C)	19	17	106

Table F

4.5. Posterior Utilities - Interventions Phase - Run 1

4.5.1 Psychologist's Median Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
4	22	22	25
4(A)	22	22	22
4(B)	22	22	22
4(C)	22	22	25
6	34	34	34
6(A)	43	34	34
6(B)	34	34	34
7	72	72	63
7(A)	72	72	72
7(B)	72	72	54
7(C)	72	72	72
8	44	35	48
9	26	32	45
10	31	25	43

Table G

4.5.2 Teacher's Median Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
4	13	13	15
4(A)	13	13	13
4(B)	13	13	13
4(C)	13	13	15
6	82	82	82
6(A)	103	82	82
6(B)	82	82	82
7	88	88	77
7(A)	88	88	88
7(B)	88	88	66
7(C)	88	88	88
8	49	39	54
9	25	32	44
10	17	13	23

Table H

4.5.3. Student Teacher's Median Weightings

Objective	Strategy - SCM	Strategy -UDM	Strategy - MM
4.	14	14	16
4(A)	14	14	14
4(B)	14	14	14
4(C)	14	14	16
6	50	50	50
6(A)	62	50	50
6(B)	50	50	50
7	76	76	66
7(A)	76	76	76
7(B)	76	76	57
7(C)	76	76	76
8	28	22	31
9	12	16	22
10	15	12	20

Table I

4.6. Posterior Utilities - Intervention Phase - Run 2

4.6.1 Psychologist's Median Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
4.	19	19	33
4(A)	17	19	28
4(B)	19	19	33
4(C)	22	19	33
6	38	34	43
6(A)	43	23	43
6(B)	43	34	43
7	72	63	90
7(A)	72	54	90
7(B)	72	54	90
7(C)	72	63	90
8	44	26	52
9	38	32	45
10	19	19	37

Table J.

4.6.2. Teacher's Median Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
4	12	12	18
4(A)	10	12	17
4(B)	12	12	20
4(C)	13	12	20
6	92	82	103
6(A)	103	82	92
6(B)	103	82	103
7	88	77	110
7(A)	88	66	88
7(B)	88	66	110
7(C)	88	77	110
8	49	29	59
9	38	32	41
10	10	10	20

Table K

4.6.3. Student Teacher's Weightings

Objective	Strategy - SCM	Strategy - UDM	Strategy - MM
4.	12	12	19
4(A)	11	13	18
4(B)	12	12	21
4(C)	14	12	21
6	56	50	62
6(A)	62	50	56
6(B)	62	50	62
7	76	66	95
7(A)	76	57	76
7(B)	76	57	95
7(C)	76	66	95
8	28	17	34
9	19	16	20
10	9	9	17

Table L

4.7. Conclusion

Tables A to L will give the interested reader some data by which to compare specific objectives across the three strategies. It should however, be again emphasised that such a level of analysis runs counter to the philosophy underpinning the research methodology used, which was to facilitate informed decision making about the various strategies as they addressed the whole range of given objectives.